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A TREATISE

ON THE

PRACTICE OF MEDICINE.

BY

JOHN EBERLE, M.D.,

PROFESSOR OF THE THEORY AND PRACTICE OF MEDICINE IN JEFFERSON MEDICAL COLLEGE;
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ETC. ETC. ETC.

WITH NOTES AND ADDITIONS

BY

GEORGE M'CLELLAN, M.D.

TWO VOLUMES IN ONE.

SEVENTH EDITION.

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TO

GEORGE M'CLELLAN, M. D.,

FORMERLY

PROFESSOR OF SURGERY IN THE JEFFERSON MEDICAL COLLEGE, ETC. ETC.

THIS WORK IS INSCRIBED,

AS AN ACKNOWLEDGMENT OF THE HIGH REGARD ENTERTAINED FOR THE

POWERS OF HIS MIND, AND THE GENEROUS SENTIMENTS

OF HIS HEART,

BY HIS OBLIGED FRIEND,

THE AUTHOR.

PREFACE.

In the composition of this work, an effort has been made to exhibit a distinct view of the essential phenomena and principles pertaining to the various subjects which it embraces, with an especial endeavor to avoid the extremes of unsatisfactory brevity on the one hand, and of fatiguing prolixity of detail and discussion on the other. With the exception, therefore, of a few instances in the introductory portion of the work, the author has indulged but little in controversial discussion and general speculation. His object has been, to give a digest of facts and established principles, rather than of opinions and points of disputation. He has not, however, failed to give an exposition of those pathological and therapeutic principles, which appeared to him fairly deducible from the particular phenomena brought under consideration; and whenever his own experience and reflections have led him to differ from others, he has freely, though he trusts with becoming deference, stated his sentiments.

It will be perceived, that no general doctrine or system of pathology is exclusively or especially favored in the following pages. Medicine, as it is now *generally* cultivated, is strictly *eclectic*. The judicious and unprejudiced physician will neither condemn nor adopt unreservedly any of the leading doctrines advanced in modern times. He will see something to admire and embrace in the systems of Brown, of Cullen, of Darwin, of Broussais—and even of the fanciful Hahnemann; although when offered to his acceptance as doctrines of universal application, he may very reasonably refuse his assent.

It will be seen, also, and perhaps by some regarded as a defect, that no formal classification has been adopted in the arrangement of the work. Nevertheless, the order that has been observed in the succession of the various subjects, is probably as natural as that obtained by any of the modes of systematic arrangement

usually pursued in works of this kind. It is now generally, and very justly believed, that the artificial, classific, ordinal and specific distinctions of NOSOLOGY have an unfavorable influence on the progress of comprehensive and philosophical views in pathology. The primary elements of disease, like those of matter, are probably but few in number. A few *elementary* modes of morbid action (if the expression may be used), modified in their general results or phenomena, by different grades of intensity, modes of combination and the structures implicated, constitute the fundamental morbid conditions of which the phenomena by which diseases are described are merely the external manifestations. It is here that the unfavorable tendency of nosological distinctions mainly exists. Instead of leading the student to contemplate the morbid symptoms as the mere external expressions or signs of disease, modified by various accidental circumstances, and especially by the structures chiefly affected, the artificial divisions of nosology are apt to lead him to regard the groups of symptoms, usually associated, as so many distinct essences, possessing fixed and specific peculiarities of character.

To these objections, the arrangements founded on the particular structure primarily implicated in the disease, are not liable. It must be admitted, however, that correct and philosophical as such a classification may appear to be in theory, the attempt to reduce it to practice is attended with many very serious difficulties. Nevertheless, should another edition of this treatise be called for, it is the intention of the author to arrange its materials upon this plan of classification.

It is not improbable that various errors may have escaped the author's attention in the course of the work; but he has no apologies to offer for any defects it may be found to possess; and he sends it into the world in the hope that, with whatever blemishes and deficiencies it may be chargeable, it will be found a useful compilation of facts and principles in pathology and practice.

EDITOR'S PREFACE TO THE SIXTH EDITION.

SINCE the death of the learned author of this work, a Sixth Edition has been called for by the repeated demands of practitioners as well as students of medicine. Notwithstanding the publication of other excellent and popular works on the same subject, the credit of Dr. Eberle's Practice has been unimpaired. A larger number of copies have probably been printed and sold than of any other medical book which has been composed in this country. By well informed practitioners, this statement cannot be considered as an undeserved compliment to the memory of Dr. Eberle. In sound medical learning, in judicious criticism, and discriminating tact, our author scarcely had his superior. As he paid me the compliment of an unsolicited dedication, after we had ceased to be colleagues in one of the medical schools of this city, it would appear to become my duty to volunteer my services in promoting the publication of this edition, by such notes and improvements as the progress of Medical Science during the last five years may have suggested.

GEO. M'CLELLAN.

Philadelphia, 1845.

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A TREATISE

ON THE

PRACTICE OF MEDICINE.

PRELIMINARY OBSERVATIONS ON THE PATHOLOGY AND ETIOLOGY OF FEVER.

CHAPTER I.

ON THE PATHOLOGY OF FEVER IN GENERAL.

The history of practical medicine consists of little else than a review of the doctrines which have successively risen and sunk again, concerning the nature and treatment of fever. Whatever other objects of interest or importance within the dominion of medical science may have attracted the attention of physicians, fever has at all times been viewed as presenting the most extensive and inviting field for observation and the exercise of ingenuity. It is in this department that observation and research have been most industrious in accumulating materials, and that hypothesis has luxuriated in her wildest exuberance.

When, indeed, it is considered that the destroying angel has made his most desolating visitations under the form of febrile epidemics, and that in the long list of human maladies, *fever* occurs in perhaps nine cases out of ten, the paramount importance of this subject is strongly forced upon our convictions.*

From a retrospective glance over the history of our science, we are forced to acknowledge that there is, perhaps, no subject which is more eminently calculated to humble the pride of human reason than this one. In relation to this subject, pathology has been in a continued state of revolution and instability. The human mind has been engaged with it for near three thousand years. Theories have risen and sunk again in a continued and rapid series of succession; each has had its hour "to strut upon the stage," and its votaries to yield it faith;

* "If we except," says Van Swieten, "those who perish by a violent death, and such as are extinguished by mere old age, and which are indeed few, almost all the rest die either of fever, or of diseases accompanied with fever. We read in Pliny with what fear and trembling the Romans endeavored to have this universal disease—*fever*, appeased by their supplications in the temple of Fanum; and hence, perhaps, it is, that fevers are called *diseases* by Hesiod, and that Horace calls all diseases simply fevers, when they rushed out of the box of Pandora—

'Post ignem ætherea domo
Subductum, Macies, et nova febrium
Terris incubuit cohors.'"

Van Swieten's Com., vol. v. p. 1.

but the stream of time has hitherto overturned all these unsubstantial, though often highly wrought fabrics.

Has the mind then made no real advancement in relation to the pathology of fever? Are we now no nearer correct and rational views concerning this important subject than were our forefathers? Has genius always wandered in idle quest, and brought back no substantial trophies from the regions of pathological speculation on this point? Far from it. Like the asymptotes of the parabola, the human mind is continually verging towards truth, although it may never reach it in relation to the essential nature of fever. There has probably never been a theory or doctrine promulgated on this subject, which did not clear away some old rubbish, or bring to fuller view some of the relations of the phenomena it presumed to elucidate. The dreams of speculation have vanished; but the facts and correct principles which were necessarily mingled with them, remain as so much valuable treasure saved out of the wrecks of former systems. The mass of solid materials which has been thus gradually accumulated, has now in a great measure displaced those vague and hypothetical foundations upon which former doctrines in relation to this subject were constructed. Hypothesis is no longer tolerated in science. Philosophy does not acknowledge her as a legitimate servant. The cyclus of her empire has gone by; and the genius of rational induction is now the only power under whose direction the votary of science presses forward to conquest in the field of knowledge.

Like many other things which are at once obvious to the senses, and concerning the existence of which almost every one can decide, *fever* does not admit of a strictly correct and unobjectionable definition; since there is not a single symptom which is invariably present, and which can be regarded as absolutely essential to its existence.

Boerhaave collected together, from a great number of authors, all the symptoms which had been observed in fevers. He then struck from this list all those symptoms which did not appear in all, but only in certain modifications of fever —retaining such only as, by the common consent of authors and his own observations, were found to be present in every instance of fever. The result was, that only three symptoms were left standing—namely, a quick and frequent pulse, preternatural heat of the surface of the body, and a sense of cold or chilliness in the commencement. But he might have gone farther, and struck from his list these symptoms also; for it is quite certain that cases of fever do occur in which there is neither preternatural quickness and frequency of the pulse, nor an increased temperature of the surface of the body; nor is a sense of chilliness, though perhaps the most constant of all the febrile symptoms, universally present in the initial stage of fever.*

Notwithstanding the great difficulty, or rather impossibility, of giving a strictly unexceptionable scientific definition of *fever*, yet the train of phenomena which this state of disease presents under all its modifications—varying more or less in their concomitance and succession—offers, upon the whole, a character sufficiently distinct and definite for easy and certain recognition.

Pathologists have divided fevers—according to the mode of their development —into *idiopathic* and *symptomatic*, and the propriety or impropriety of this division constitutes, at the present day, one of the most important and warmly contested subjects in pathology. By the former class, are understood those fevers that are developed and sustained by causes which produce a general morbid state of the system, independent of local inflammation or fixed irritation. Those

* [In malignant epidemics patients often die in the forming stage of disease, before febrile reaction is manifested. Nevertheless the case is pronounced to be one of the prevailing fever. Congestive fevers are described by many authors in which there was never any development of external heat or excitement of the pulse. It is questionable, however, whether this is not too extensive an application of the term. If every condition that precedes or accompanies a fever is to be designated by the same epithet, there will certainly be no occasion for the extension of nosology.—Mc.]

who admit the existence of such fevers, suppose that the remote febrific cause produces a deleterious impression on the sentient extremities of the part upon which it acts, which, deranging function after function, according to the catenation of the organic sympathies, finally results in a state of general disease, characterized by the ordinary phenomena of fever; or, as they presume, the remote cause may gradually change the healthy character of the circulating blood, which, acting as a morbific irritant on the heart and arteries, gives rise to febrile reaction.

Many eminent pathologists, on the contrary, contend that such fevers can have no existence; and that all febrile excitement is purely symptomatic, and of course essentially and wholly dependent on a pre-established local irritation or inflammation. According to these views, the direct influence of the remote cause of fever is limited to the production of the primary local inflammation or irritation, the subsequent pyrexial phenomena being the result solely of this primary local affection; in other words, the secondary and sympathetic excitement of the pre-established focus of irritation. At the head of those who advocate the exclusive symptomatic nature of fever is Broussais, who, whatever may be thought of his peculiar doctrines in relation to this subject, has manifested a professional zeal, and an activity and acuteness of intellect which have justly placed him high among the "greater lights" of our profession. Not satisfied, however, with the adoption and defence of the general doctrine of the universality of *symptomatic* fever, Broussais contends that the inflammation or irritation whence the febrile sympathies radiate as from a focus, is almost universally located in the mucous membrane of the alimentary canal; and hence *gastro-enteritis* is with him the *fons et origo* of febrile phenomena.

That fever is a very common result of local inflammation, is unquestionable. So intimate are the sympathetic relations between all the various parts of the animal body, that no structure or organ can be strongly irritated without causing a sympathetic irritation in other organs or structures. If the primary irritation involve the sanguiferous capillaries, the irritation will be communicated by sympathy to the general vascular system, and fever will be the result; but if the local irritation be purely nervous, it will be diffused, and as it were locked up in the general nervous system, and give rise to convulsions, or some other form of general nervous affection. Without doubt, too, inflammation of the mucous membrane of the alimentary canal is much more common in febrile diseases than was formerly, and by many, is still supposed. It is even probable that in many instances of fever, such an inflammation constitutes the *primary* and essential cause of the febrile phenomena. This is, perhaps, most apt to be the case in those instances of fever which result from the combined agencies of impure and indigestible diet and atmospheric vicissitudes. But although we may admit the correctness of these observations, yet to refer all fevers, remitting, intermitting, and continued, to *gastro-enteritis*, is as remote from truth as it is detrimental in its influence on practice.

The advocates of the *physiological* doctrine, as it is called, endeavor to support their sentiments in relation to this subject, by the phenomena detected on post-mortem examination, and by arguments founded on physiological principles. It is affirmed that marks of inflammation almost universally occur in the mucous membrane of the alimentary canal, in subjects that die of febrile affections. The capillary vessels, to a greater or less extent, of this membrane, it is said, are found injected; and in many instances other and less equivocal traces of previous inflammation are discovered. Admitting that such manifestations of inflammation are as universal as they are asserted to be, is there not much reason to believe that, very frequently at least, the inflammation *supervened* during the course of the disease, as a *consequence* of the fever, rather than that the inflammation was pre-established, and became the immediate exciting cause of the febrile phenomena? We frequently see inflammations supervene in parts exposed to observation many days after general fever has been fully established. Indeed, when it is considered that in all febrile affections, the secretions which are poured into

the intestinal tube are unnatural and vitiated—that the process of digestion is suspended, or much impaired, and consequently, that fermentation and decomposition of the contents of the stomach and bowels are especially favored—is there any cause to wonder that we should so often meet with traces of inflammation in the digestive organs in those who die of febrile affections? The Broussaian mode of treating fevers, although especially meant to obviate such inflammations, appears to me, in one respect, well calculated to favor their occurrence. The almost total proscription of purgatives from the list of our remedial means for the treatment of fever, so far from lessening the tendency to gastro-enteritis, tends, I conceive, in general, to an opposite result. In a recent work by Bouillaud, there are upwards of sixty cases of fever reported, in not a single instance of which was there a purgative medicine administered by the mouth. In all of these cases, however, marks of inflammation, and, in the majority, ulcerations were detected in some portion of the mucous membrane of the bowels. That this should have been observed, will not appear strange, when it is considered that in all the cases, most of which continued from three to four weeks, all the acrid and vitiated contents of the intestines were suffered to remain, undisturbed, to act on their delicate lining membrane.

To one not thoroughly imbued with Broussaism, it does appear strange that any one should withhold a laxative, under the apprehension of its causing injurious irritation, and yet suffer, without any such fears, the most irritating substances to lie quietly in the bowels. It is true, laxative *lavements* were repeatedly resorted to in these cases, but that these did not disturb or remove the acrid materials which were enclosed in the bowels, is abundantly manifest from what Mr. Bouillaud himself has stated. After having gravely told us that in all the cases he describes, the traces of mucous inflammation in the bowels were *très prononcé*, he states that "in general the stomach and small intestines were *filled with a yellowish or greenish bile, and that the residue of the alimentary substances, which were found in the small and large intestines, invariably exhaled an intolerably fetid smell, and frequently exhibited the consistence of mustard. This residue, mixed with various fluids secreted in the intestines, appeared to have undergone a complete process of putrefactive decomposition, as was evident from the extreme offensiveness of the smell, and the fetid gas which distended the bowels.*"*

Can it be reasonably supposed that the transient and moderate irritation of a purgative in these cases would have been more injurious than the constant impressions of the acrid and irritating substances which were so long left in immediate contact with the bowels? It is thus, it can hardly be doubted, that many instances of gastro-enteritis, so abundant in the practice and dissections of the Broussaian school, are developed. Were laxatives employed with due moderation, it is probable that the so much dreaded *gastro-enterite* would, in some instances at least, perhaps in many, be prevented, and the world deprived of a large proportion of those triumphant demonstrations which are continually brought out in formidable array in support of the *physiological doctrine*.

As a further offset to the evidence adduced from post-mortem examination, it must be observed, that so far as the mere redness or injected state of the mucous membrane is concerned, we can draw no certain inference as to the previous existence of inflammation in this structure. That these phenomena are frequently the result of changes effected in *articulo mortis*, or *post-mortem*, is fully demonstrated by the observations of Mr. Yellowly and of Mr. Seeds.†

* Traité Clinique et Experimental des Fièvres. Par J. Bouillaud. Paris, 1826.

† "It must have happened to every one," says the former of these writers, "accustomed to the examination of dead bodies, to see appearances of vascular injection in the villous coat of the stomach. Such appearances have very frequently been referred to inflammation, but they have probably been but little studied. I have several times been present at the examination of bodies, where the vascularity of the villous coat of the stomach was so considerable as even to give rise to suspicions that the appearance had been produced by something deleterious. I was

Broussais and his followers are, indeed, fully sensible of the observation of Celsus: *Neque quicquam esse stultius quam quale quid vivo homine est, tale existimare esse moriente imo jam mortuo;* for where they fail in detecting a red and injected state of the mucous membrane of the bowels, they account for its absence by ascribing it to a *post-mortem* change; thus availing themselves of this fact when it affords an argument in their favor; whilst they manifest an unwillingness to allow any importance to it when it is adduced against their doctrine.

It cannot, indeed, be presumed that the injected state of the mucous membrane of the intestinal tube, so often discovered in those who die from fevers, is always, or even generally, to be ascribed to a mere post-mortem change; but that such changes do sometimes, nay, often occur, and that they have been assumed as evidences of previous inflammation, there can exist but little doubt.

The first obvious effect of the remote febrific causes, consists almost universally in a diminution of the nervous energy, and consequently of the action of the heart and arteries. This is manifested by the weak and contracted pulse, the general languor and lassitude, the diminished temperature and the sense of chilliness which usher in all febrile affections. These initial phenomena of fever are especially conspicuous in intermittents, remittents, and in catarrhal affections. There is nothing in the character of these symptoms which can justify the inference that they are dependent on inflammation. "Inflammation," says Dr. Armstrong, "cannot exist in the cold stage of fevers, all the phenomena of which are directly opposed to inflammation." The course and phenomena of intermitting fevers present us, indeed, with insurmountable objections to the "*physi-*

therefore induced to embrace frequent opportunities of viewing the state of the inner surface of the stomach, and I so often found in it the appearances alluded to, as to induce me to imagine, that the opinion which is commonly entertained of their being marks of disease, is not well founded. In persons suddenly destroyed, when apparently in perfect health, he found the mucous membrane of the stomach highly injected." Mr. Seeds, too, found that in animals bled to death, the membranous structures frequently exhibit a state of injection which might, at first sight, be readily mistaken for inflammation.

It is well known that the arterial tubes possess a power of contracting to a considerable extent, by what Bichat calls the contractility of texture, and that this power is not limited to the period of life, but continues some time after death. It is equally ascertained that the capillaries are endowed during life with a peculiar degree of sensibility which causes them to resist the entrance of such fluids as they are not destined to convey in the performance of their natural functions. This peculiar sensibility, by virtue of which the serous capillaries refuse, or contract against the intromission of red blood, would seem to depend on the regular influx of the nervous influence. That this is the case, appears highly probable, if not certain, from the different results arising from the forcible injection of fluids into the arteries of living and dead animals. "Push into the aorta of a living animal, by means of a syringe, different fine fluids, and you will never see them fill the capillary system, or issue by the exhalents;" when, however, the same experiment is performed on an animal soon after death, the fluid will be found to pass readily into the serous capillaries, and pass out by the exhalents, excretory ducts, &c. (*Bichat*). Mr. Buniva's experiments, quoted by Bichat, with injections upon dead and living animals, illustrate this fact in a very striking manner. He fixed the pipe of a syringe into an artery of a living animal; on endeavoring to force the fluid into the vessel he found very great resistance, the piston passing down very slowly, and only with the application of much force. On causing the animal to be suddenly killed, by dividing the spinal marrow just below the occiput, the fluid passed rapidly out of the syringe into the artery, although but little force was applied. While the capillaries retained their full portion of vitality, they resisted the introduction of the fluid; but as soon as they had lost their sensibility, in the death of the animal, they yielded like passive tubes to the fluid forced upon them by the *vis à tergo*. The application of these facts to the *post-mortem* production of a red and injected state of the membranous structures, especially the more vascular ones, is easily to be understood. So long as the serous capillaries retain their vitality, they resist the entrance of red blood into them. As soon, however, as their vital properties cease to exist, they lose the power of resisting the intromission of red blood—becoming, in fact, mere passive and yielding tubes. But as the arteries continue to contract on their contents, some hours after the extinction of life, they must necessarily force the blood forward into the relaxed and unresisting capillary system, into which it will therefore be driven, as into a sponge, and give to the more vascular structures the red and injected state so often found on *post-mortem* examination, where no previous inflammation whatever existed.

ological doctrine." The periodicity of these fevers is strongly opposed to the idea of their immediate dependence on the gastro-enteritis. It is, indeed, true, that affections of an inflammatory character have been known to recur in a strictly periodical manner; but such cases must be viewed as anomalies, and altogether contrary to the almost universal course and character of phlegmasial diseases. An inflammation which observes a perfect periodicity in its attacks, must be *sui generis*. If intermitting fever depend on inflammation of the mucous membrane of the alimentary canal, then must this inflammation be periodical, and therefore essentially distinct from the inflammation which produces *remitting* fever; for in this malady it must be continuous. These two forms of fever are, however, produced by the same remote cause; and we are therefore forced to admit, by the assumption of this doctrine, that the same remote cause is capable of producing two kinds of inflammation essentially distinct from each other. The character of the remedies, too, which have been found most effectual in arresting intermitting fever, is directly opposed to the idea that *gastro-enteritis* constitutes its proximate cause. Who can believe that quinine, arsenic, black pepper, and other remedies of a similar character, are peculiarly calculated to cure inflammation of the mucous membrane of the alimentary canal? Indeed, these very articles appear to be particularly dreaded by the disciples of this doctrine, on account of their tendency to create gastro-enteritic irritation, and yet all experience goes to prove that they are decidedly the most prompt and valuable means for the cure of intermitting fever.

M. Broussais's theory of the mode in which the remote causes of febrile affections produce gastro-enteritis is gratuitous, and but little calculated to satisfy the understanding. "Every irritation," he says, "which is capable of producing a perception in the brain, passes back by the nerves *to be repeated in the mucous membranes.*" Thus, if a person be inoculated with small-pox virus, the irritation of the primary pustule, or of the inoculated point, is conveyed to the brain, whence it is reflected by the nerves upon the mucous membranes of the alimentary canal, where it establishes an inflammation. This intestinal inflammation constitutes the essential cause of eruptive fever, and the eruption itself is only a metastatic disorder of the cutaneous system. The assumption, then, "that every irritation which is capable of producing a perception in the brain, is reflected by this organ to be *repeated in the mucous membranes* of the alimentary canal," forms the main principle in the Broussaian doctrine of the etiology of fever. That the mucous membranes of the intestinal tube possess a very wide sphere of sympathetic relations, is a fact indeed as undeniable as it is important in a pathological point of view. But that this structure constitutes a subordinate sensorium commune, to which all morbific impressions are especially conveyed, after having been perceived by the brain, is a position which all the zeal and ingenuity of its advocates have as yet failed, and I apprehend will ever fail, to place upon that firm basis which it ought to have to serve as a foundation of our pathological faith.

I do not mean to object to the general fact, that all impressions capable of ultimately exciting fever, are in the first place communicated to the sensorium commune, and thence reflected throughout the system, and sometimes upon some particular organ or structure; but this reflected impression does not, it may be justly maintained, necessarily establish a focus of irritation, nor always, or even generally, fall especially upon the intestinal mucous membrane.

If the impressions of morbific causes are always transferred to the mucous membrane of the alimentary canal, the impressions of all agents, remedial as well as others, must of course be referred to the same structure. This, however, does not accord with the results of observation. When mercury is rubbed on the skin, the salivary glands, the gums, and the mucous membrane of the mouth, receive the chief impressions excited by this agent. Will it be contended that a gastro-enteritis must be established before salivation can be produced? If opium be applied to any part of the body, the impressions are concentrated in the nervous

centre. When cantharides are applied to the surface, the irritation is conveyed to the neck of the bladder, and not to the mucous membrane of the bowels, and yet fever may be the result. From these and many other similar facts that might be adduced, it is manifest that the supposed law of the animal economy, by which, as is alleged, all febrific impressions are reflected from the brain and *repeated* in the mucous membranes of the bowels, is gratuitous, or to say the least, highly improbable.

The fallacy of those doctrines which confine the primary inflammation to some one structure exclusively, is strikingly illustrated by the circumstance, that different writers have fixed on *different* structures, as the parts primarily affected in fevers. Thus Clutterbuck maintains, with Broussais, that fever is always a purely symptomatic affection depending on local inflammation pre-established by the febrific cause. He asserts that this primary inflammation is invariably located in the brain and its membranes, and adduces the phenomena discovered on post-mortem examination, in testimony of the correctness of his doctrine. Broussais, on the other hand, asserts that the primary inflammation is not in the brain, but in the mucous membrane of the bowels, and appeals with equal confidence to the appearances exhibited on dissection for confirmation of *his* doctrine.

This discrepancy is in itself sufficient to show the weak foundation on which these two doctrines rest; for if the evidence afforded by autopsic inspection in relation to this subject were not extremely ambiguous, it would, one may suppose, be impossible to draw from it conclusions so very discrepant, and yet so nearly equal in point of plausibility.

The advocates of the gastro-enteritic pathology of fever place no inconsiderable reliance for support to their doctrine on, what they are pleased to assert, their superior success in their remedial management of fevers. Leeches, and an almost total abstinence from food, with cooling, acidulated, mucilaginous drinks, constitute nearly the whole of their remedial applications; and they claim for this mode of treatment a greater success than that which they allow to others who pursue a more active course of treatment in fevers. It does not appear, however, that the golden age of medical success, so confidently promised by Broussais, on the introduction of his doctrine, has as yet arrived;* for the statements which have been published in France, in reference to the comparative mortality under the Broussaian, and the other modes of treatment, give no support to the claims of superior success set up for the former. We might, however, admit the excellence of the Broussaian mode of treating fevers, without yielding our assent to the correctness of the doctrine that the gastro-enteritis is primary where it *does* exist. There exists but little doubt in my mind, that in continued and remitting fevers, active purgation is not unfrequently carried to an injurious extent; for, although we may, and, as I conceive, ought, to reject the opinion that such fevers *depend* essentially on the gastro-enteritis, yet we cannot doubt, that a very considerable degree of irritation, amounting in many instances to inflammation, does often *supervene* during the progress of the disease, as an *epiphenomenon*, and unconnected with the origination of the fever. In cases where such a condition of the mucous membrane of the intestinal canal occurs, during the course of the disease, the soothing treatment recommended by Broussais, is no doubt more salutary than the vigorous purgative plan so commonly pursued in this country and in England. Unquestionably, intestinal irritation and inflammation perform an important part in febrile diseases. These conditions may

* In 1821, Broussais asserted "that the tables of mortality declare in favor of the *new doctrine*, and that *its influence upon population would be more favorable than that of the introduction of vaccination.*" Unfortunately, however, this happy influence of the *nouvelle doctrine* remains yet to be realized;† and the advocates of the doctrine may console themselves for the tardiness of this influence, with the certain prospect of not being very soon deprived of the opportunity of publishing their ordinary quantum of *post-mortem* examinations.

† Refutation de la Doctrine de M. L. Doct. Broussais, par L. Castel.

arise as consequences of the general febrile reaction, as well as from harsh and repeated purgation, and the use of other irritating remedial agents. But it is equally probable that *gastro-enteritis* is often excited by acrid and vitiated secretions, and other offensive materials retained in the bowels in consequence of withholding suitable laxatives, in the commencement and during the progress of the malady. Broussais has done much good, by awakening the attention of the profession to these pathological conditions; and thus furnishes another proof of the fact, that new doctrines, though fundamentally erroneous, seldom fail to do some good, by directing the views of physicians to important circumstances, which were previously overlooked, or too much neglected.

In leaving this subject, I deem it right to observe, that however widely we may differ from Broussais in relation to the pathology of fever, all must admit that he has just and high claims to the respect and gratitude of the profession for the light which he has thrown on the nature, symptoms and treatment of mucous intestinal inflammation, as well as on the physiological and morbid sympathies of the animal system.

Broussais is unquestionably one of the most enlightened and ingenious pathologists of the present day. His is now the only general doctrine which especially occupies the attention of the profession. Like all the preceding great doctrines in medicine, it is destined, perhaps, to culminate for a while in the firmament of our science, and to attract its host of worshipers; but, assuredly, sooner or later it must sink again, and add another to the long list of once highly-favored, but now exploded and neglected doctrines. That the Broussaian system contains much that is valuable, it would be unjust to deny; but to these concessions in its favor, there are, unless the majority of competent judges greatly err, offsets of no small moment. In relation to this doctrine, as indeed to every one else, it behooves us to embrace the useful and reject the false; in short, to adopt the good advice of Lucretius,*

"——— ——— doctrinam acri
Judicio perpende; et si tibi vera videtur
Dede manus—aut si falsa est, accingere contra."

Having now given a summary of the principal objections which may be urged successfully, I conceive, against the "new physiological doctrine," I proceed to an exposition of the following propositions, as embracing the leading, and it is believed, tenable points of doctrine, in relation to the mode of origin and character of febrile diseases.

1. Fever is a general disease—the sanguiferous system being essentially and predominantly disordered.

2. The morbid vascular excitement of fever is located, essentially, in the

* [Clutterbuck's opinion, published in 1807, gave origin to the doctrine that fever is not a primary affection, but essentially a local inflammation, the seat of which is in the brain. Frank, of Vienna, attributed fever to an inflammation of the arterial system; and some of the Italian physicians extended the same idea to the inner coat of the *vena porta*. The advocates of the non essential doctrine of fever, however, have chiefly proceeded on the foundation of Broussais. As often as they have been able to detect any trace of morbid alteration of structure in the intestinal canal, after the termination of a fever, they have attributed the general disorder to a local cause. It had long been known that the glands of Peyer and Brunner, in the mucous coat of the small intestines, were liable to inflammation and even ulceration. But it was reserved for the celebrated Louis, of the Hotel Dieu, in Paris, to discover that such a condition of these small glandular follicles, especially the conglomerate ones, was the true cause of one of the most frequent forms of fever. The progress of pathological anatomy has unquestionably developed new and important facts; but we may doubt whether it has not of late given a wrong direction to medical inquiry. Effects and concomitant phenomena are perpetually mistaken for causes. It would not surprise us if some writer should come out with the doctrine that cutaneous eruptions and scabs, and that buboes and carbuncles, are the true causes of the small pox and plague.—Mc.]

capillary system of blood-vessels—consisting in *irritation*, and not in mere *increased* or *decreased* action.

3. This irritated excitement may be the result of morbific causes acting directly on the internal surface of the sanguiferous system; or, of irritating impressions conveyed sympathetically to this system, from a primary focus of irritation.

4. The first link in the chain of morbid actions, which occur in the development of fever, always commences in the nerves.

5. The remote or exciting causes of fever rarely produce local inflammation, anterior to the development of the general febrile reaction. Their action is confined to the production of morbid impressions on the nerves, which passing inwards to the brain, usually cause a temporary depression of its energies, and consequent disturbance in the equilibrium of the nervous and vascular excitements; at the same time that the morbid impressions reflected by the brain throughout the system, contribute to the functional disturbance and irritation of certain internal organs or structures.

6. Although local inflammation is not essential to the production and support of fever, yet, in many instances of idiopathic or general fever, more or less inflammation supervenes, after the febrile reaction is established; and occasionally the development of the febrile excitement and local inflammation is effected simultaneously.

7. Inequilibrium of excitement, and local determinations of blood, constitute an important characteristic of fever; for, although strictly a general malady, there are always some organs or structures in a state of increased morbid excitement, whilst, at the same time, others are in an enfeebled, languid or torpid condition.

In stating that fever is a general malady, it is not presumed that every structure of the organization is in a state of actual disease; but as the nervous and vascular systems are so intimately concerned both in the composition and functions of every part of the body, it may well be inferred, that where these two systems are in a morbid condition, as they manifestly are in fever, every other irritable and sensible structure must suffer more or less functional derangement. Nevertheless, it cannot be questioned that the essential morbid excitement, which constitutes fever, is located in the sanguiferous system. The disordered action of the heart and arteries—the increased temperature of the body—the altered state of the secretions—the morbid appearances on dissection—and, in most instances, the changed state of the blood, afford sufficient evidence of the paramount disorder of the blood-vessels in febrile affections.

The morbid vascular action of fever is an irritated and not a mere increased action of the heart, arteries and capillaries. There exists a wide difference between *irritation* and mere *excitation*. The former is the result of stimuli acting either directly or indirectly upon an organ or structure, whose vital properties are in a deranged or morbid condition; and is therefore always essentially connected with a disordered state of the nerves of the part affected. This result is not simply a greater or less degree of the natural or healthy excitement, but an action or excitement essentially morbid or distinct from healthy action. Mere excitation, or increased action, on the other hand, is the result of stimuli acting on an organ or system whose vital properties remain in a healthy or underanged condition. A few ounces of alcohol, for instance, will cause a high degree of arterial action in an individual not accustomed to this stimulus; and the same effect will be produced by any sudden and violent bodily exertion, as running, rapid walking, &c. Here, then, there is *increased* action of the heart and arteries, with an augmented state of the animal temperature; but this does not constitute fever. The vital properties remain in their normal condition, and the organs thus inordinately excited, return to their natural and healthy grade of action, as soon as the exciting cause ceases to act. As, however, all excessive action tends to weaken, and finally to derange the vital properties of the over-excited parts, so, when such stimuli are very protracted in their influence, they may, at last, disorder these properties and give rise to fever. Without such a derangement or morbid condition of the sensibility

and irritability of the heart, arteries and capillaries, no fever can occur; for so long as the vital properties are in their natural state, all irritants or stimuli can produce only a greater or less degree of normal excitement, and the secretions will be diminished or increased, but not depraved. As soon, however, as these properties have departed from their healthy condition, every stimulus, whether natural or morbific, must necessarily excite morbid actions. Hence, it may be concluded that every cause which produces fever, in whatever way its influence may be conveyed to the sanguiferous system, must necessarily derange its vital properties, either directly or indirectly, before that general irritated vascular action which constitutes fever, can be established.

It is evident, therefore, that although the characteristic phenomena of fever depend on morbid action of the heart, arteries and capillary vessels, the nerves also are essentially and primarily disordered in febrile diseases; for irritation, as has just been observed, necessarily implies a morbid or deranged condition of the vital properties, and it cannot be doubted that, so far, at least, as the capillary system is concerned, these properties are derived immediately from the nerves.

From a careful analysis of the phenomena of fever, it would appear that, although the sanguiferous system, generally, is prominently disordered in fever, yet the essential febrile excitement is especially located in the capillary system of blood-vessels. Fever cannot exist without capillary irritation or derangement of the secretory and excretory functions. So long as the capillary functions remain free from morbid excitement, or the principal secretions continue to be performed in a healthy manner, no increased action of the heart and arteries can constitute fever, but only an over-excited state of these organs, which will subside when the exciting cause is removed. A person who is thrown into a violent gust of passion, experiences vehement action of the heart and arteries; but unless the capillary vessels are brought into a state of morbid excitement, or irritation, it will not be fever, but simple super-excitation.* On the other hand, *manifest* disorder in the action of the heart and arteries, does not appear to be essential to the existence of fever. Fevers of the most malignant and fatal character—attended with unequivocal manifestations of capillary disorder, such as hemorrhage, petechiæ and inflammation, not unfrequently occur, in which no obvious deviation from the natural action of the heart and arteries can be detected. Dr. Smith, in his very valuable treatise on fever, observes, that the order in which the morbid actions which constitute fever, occur, "is, first, derangement in the nervous and sensorial functions; this is the invariable antecedent: secondly, derangement in the circulating function; this is the invariable sequent: and thirdly, derangement in the secreting and excreting functions: this is the last result in the succession of morbid changes. Derangement in the functions of secretion and excretion never comes first in the series: derangement in the nervous and sensorial functions never comes last in the series: derangement in the function of the circulation never comes either first or last in the series, but always the second in succession."

That derangement of the nervous system constitutes the initial link in the chain of morbid actions which occur in the development of fever, cannot be doubted. The mental and muscular languor—the general *malaise* and uncomfortable sensations—the pains in the loins and extremities—the morbid sensibility to low temperature—the dejection and irritableness of temper, and the confusion and weakness of the intellectual powers, which so universally usher in febrile diseases, afford unequivocal evidence of pervading derangement in the nervous system.

In relation to the subsequent order of the morbid changes which supervene in

* Some of the sentiments stated in this chapter, do not differ materially from those given by Dr. Southwood Smith, in his interesting work on fever. The views here given, whether correct or incorrect, I have taught in my public lectures for seven years past.

the development of fever, however, we cannot adopt the sentiments expressed by Dr. Smith. The assertion that the heart and arteries are universally and necessarily deranged, next in order to the primary disorder of the nervous system, and before the capillary or secretory extremities of the blood-vessels are brought into a state of morbid excitement, appears, I think, contrary both to correct physiological principles, and to the results of observation. It is well known that the extreme vessels, the secreting capillaries, are incomparably more closely connected with, and dependent for their functions on, the nervous system, than the heart and larger blood-vessels. It is scarcely necessary to refer to the experiments of Wilson Philip and other modern physiologists in support of this observation. From this physiological principle alone, then, we would be led to infer, that the extreme vessels—those which are immediately, or at least very intimately, concerned in the process of secretion and calorification—would be the first to suffer derangement of function from general morbid excitement of the nervous system. That capillary derangement is, in fact, the immediate sequent of the primary functional disturbance of the nervous system in the evolution of fever, appears to me sufficiently demonstrated by the phenomena presented in the forming stage of the disease. Who does not know that torpor of the cutaneous exhalents is one of the most common initial symptoms of fever? This function is frequently prominently deranged, before any manifestations of the morbid action of the heart and arteries can be detected. When kiono-miasmata acts slowly upon the system, we often find, along with the above-named symptoms indicative of disordered nervous excitement, decided evidence of functional derangement of the liver, as well as of the perspiratory vessels. The utter groundlessness of Dr. Smith's sentiments on this point, may, indeed, be predicated on the simple circumstance, that it has led him, necessarily, to deny, that pneumonia, hepatitis—in short, all the affections embraced under the general term *phlegmasia*, are fevers! Believing, as he does, that the order of morbid changes, from the nerves to the heart and arteries, and finally, to the secretory capillaries, is universal, and as invariable as the laws of nature, he is, of course, obliged to deny the name of *fever* to the general sympathetic phenomena which occur in consequence of local inflammation—for in these *symptomatic* fevers the successive morbid changes occur, he says, in a different order. "Febrile diseases," he observes, "are commonly divided into idiopathic and symptomatic—a division which is liable to the fundamental objection, that the diseases included under the second head *are not fevers*, but inflammations. *There are no fevers but idiopathic fevers.*" And the reason why the general symptoms of the phlegmasia do not constitute fever is, he says, because "in pneumonia, in enteritis, in hepatitis, &c., the spinal cord and the brain are *never* the organs in which the *first* indications of disease appear; the earliest indications of disease that can be discovered, having their seat in the affected organ itself, and it being only after the disease has made some progress, that the other organs (the heart and arteries, and the brain) and functions are involved." Ingeniously as Dr. Smith has argued upon this subject, very few, it may be presumed, will agree with him in denying that the general morbid actions arising from local inflammation, are truly and essentially febrile. In truth, however, the alleged diversity in the order of the morbid changes of idiopathic and symptomatic fevers, has no existence. Local inflammation, like every other exciting cause of fever that does not act directly on the heart and arteries, can affect the general system only through the medium of the nerves; and hence, we almost invariably find the same train of symptoms accompanying the rise of fever from inflammation, as is known to usher in idiopathic fever. What do we observe when fever comes on from a wound? The patient, at first, experiences some degree of febrile languor—accompanied with a sense of slight chilliness, *malaise;* and derangement of the exhalent functions of the skin. These symptoms, though often so slight and transient as to be scarcely perceptible, invariably precede the occurrence of the febrile reaction of the heart and arteries; and hence the order of sequence in the morbid

actions, which take place in the development of symptomatic fever, does not differ from that which obtains in idiopathic fever. The nerves always receive the first shock and morbid change. This speedily gives rise to more or less conspicuously deranged action of the secretory capillaries—and finally the heart and arteries are morbidly excited.

While Dr. Smith, more confidently than prudently, asserts that "there can be no fever but idiopathic fevers," Broussais and his disciples assert, that "the existence of idiopathic fever is impossible." Such are the contradictory extremes to which theory is apt to lead the understanding! That fever may occur both with and without local inflammation, may be disputed by theorists, but cannot be doubted by those who observe diseases with unbiased judgments, in the light of common sense.

It must, indeed, be admitted, that *local* irritation or *local* morbid action invariably occurs, as the initial morbid condition, whence the series of consecutive deranged actions in the evolution of fever have their origin. This admission does not imply a concession in favor of the Broussaian doctrine, since it is predicated, in part, on the demonstrable position that the local morbid excitement is not unfrequently located in a greater or less extent of the lining membrane of the blood-vessels themselves, and produced by irritating agents admitted into the circulation from without, or by retained recrementitious elements acting directly on the internal surface of the sanguiferous system.* It appears to me that there is no pathological fact which is more susceptible of satisfactory illustration, than that fever frequently arises from morbific causes acting immediately on the sanguiferous system, and establishing a primary irritation in a greater or less extent of its internal lining membrane.

Without denying the all-pervading influence of that principle of the living system, called sympathy—or still more comprehensively, without denying that all the phenomena of life, whether of health or disease, are but so many manifestations of the *action of the living solids*, it is a truth equally undeniable, that the blood may and does frequently serve as the medium through which deleterious agents act immediately on the heart and arteries, and thus give rise to febrile phenomena. "The venous system," says Bichat, "may be regarded as a general reservoir, into which are poured all the materials which are to be thrown out of the body, and all those which are to enter it. In this last respect, this system of vessels performs an essential part in the production and support of diseases. The deleterious substances may be introduced into the blood-vessels with chyle, and produce ravages in the system in circulating with the fluids. There can be no doubt, moreover, that, besides the principles which convert the venous into arterial blood, there often passes through the lungs into the circulation, deleterious miasmata, which produce diseases, as my experiments on asphyxia have proved. The intestines, the lungs, and the skin are the three avenues through which the morbific agents may gain admission into the circulation."†

That foreign substances are readily taken up by the absorbents and veins, and conveyed into the circulation in an unassimilated state, is now no longer a subject of doubt or dispute. It appears to me highly probable, that *miasmatic* agents act upon the animal system, in part at least, by being admitted through the lungs, into the current of the circulation. Some contend that these aërial morbific causes act primarily on the stomach. It is asserted, that the miasma, becoming entangled in the saliva, and swallowed with this fluid into the stomach, establishes a primary morbid impression in its delicate mucous membrane. It is alleged, in confirmation of this opinion, that the stomach, possessing a very extensive circle of sympathetic relations, and being highly sensitive to impressions, is peculiarly calculated to become the primary focus of morbid excitement

* M. Bouillaud, whose work I have already mentioned, advocates this view of the etiology of certain varieties of fever.

† Anatom. Génér., vol. i. p. 284.

from external morbific causes. It is affirmed, moreover, that the initial symptoms of fever point out the primary influence of the febrific cause on the stomach. The depressed or abolished appetite, the nausea and vomiting, and the peculiar sense of uneasiness in the epigastrium, are considered as affording strong evidence of the correctness of this opinion. It is asserted, finally, that the lungs are endowed with an inferior degree of sensibility, and that their sympathetic relations are by no means very extensive, and that, therefore, they are but imperfectly adapted for receiving and propagating morbid impressions from external causes.

In reply to these arguments, it must be observed, that it does not seem probable that a sufficient quantity of miasmata could gain admission into the stomach to produce disease. As to the evidence drawn from the character of the premonitory symptoms, it cannot afford any available support to this doctrine. A severe wound, or contusion, will give rise to nausea, vomiting, and immediate loss of appetite. Such phenomena only show that the stomach readily sympathizes with impressions made on every part of the body, when of sufficient degree of intensity. With regard to the alleged insensibility of the lungs, or their limited sphere of sympathy, we might admit its justness without being reduced to the necessity of adopting the opinion that miasmata act primarily on the stomach. It is not presumed that aërial morbific agents act simply on the nervous extremities of the respiratory passages, and thus give rise to a chain of sympathetic morbid actions. It is contended, that agents of this kind pass through the lungs into the current of the circulation, or effect certain morbid alterations of the blood, in consequence of which, the lining membrane of the heart, arteries, and capillary system is irritated, and the vascular system thrown into a state of febrile excitement. That agents of this kind are absorbed into the circulation, and act upon the system through the medium of the blood, may be inferred from a number of familiar facts in relation to the inhalation of odoriferous effluvia. The inhalation of the fumes of turpentine, of garlic, and of various other substances of a similar character, is speedily followed by the manifestation of these odors in the urine. How are we to account for the extraordinary effects which arise from the inhalation of nitrous oxide, and of the vapor of sulphuric ether? It does not seem probable that these effects are produced by the mere action of these causes on the pulmonary nerves; for when these substances are taken into the stomach, the nerves of which are so highly sensitive, no such consequences ensue.

These facts go to show, that substances capable of affecting the animal economy, will, when admitted into the lungs in a gaseous form, promptly and powerfully exert their peculiar influence upon the system. There are no good grounds, therefore, for denying that miasmata and contagious effluvia may produce their deleterious effects through the same avenue. The bronchial tubes and cells expose a very extensive surface to the impressions or absorption of such agents; a circumstance which, it may be presumed, is well calculated to favor their morbific influence on the system. The experiments of Magendie, in relation to the effects of putrid effluvia on the animal system, may also be cited in favor of this opinion. On exposing animals to the inhalation of putrid effluvia, some suffered no injury, whilst others rapidly emaciated, and died at different intervals within twenty days. When, however, the putrid substances, from which the effluvia experimented with emanated, were introduced into the stomach, no obvious inconveniences were experienced by the animals.* To these facts we may add, that small-pox virus, when swallowed into the stomach, will not, or, at all events, extremely seldom, infect the system; whereas every one knows how readily the disease is communicated by inhaling the effluvia which emanate from the bodies of those who labor under the malady.

It appears very evident, therefore, that *aëriform* febrific agents act upon the

* Journal de Physiologie, 1823.

system through the medium of the respiratory organs; and the facts just mentioned render it highly probable that they enter into the current of the circulation, and act immediately on the internal surface of the heart, arteries and capillaries, perhaps more commonly on some portion of the latter set of vessels.

It is not presumed, however, that agents of this kind always, or perhaps at any time, act exclusively through the medium of the blood, in the way just stated. Any part of the organization which exposes a sensitive surface to the impressions of such causes, may, no doubt, enable them to operate injuriously on the general system. All that is here contended for is, that morbific agents of every kind, but especially gaseous substances, do often pass into the circulation, and that being thus mixed and carried along with the blood throughout the system, they act directly on the nervous extremities of the internal membrane of the vascular system, and thus excite febrile reaction, without the previous establishment and agency of local inflammation.*

Besides the source of direct vascular irritation already referred to, there is another one, perhaps still more common and extensive in its influence; namely, retained recrementitious matter, in consequence of accidental glandular torpor or inactivity. When an excretory organ is impeded in its functions, and ceases to effect a due elimination of the recrementitious matter which it is destined to cast off, the effete elements must necessarily remain in the blood, unless some other organ vicariously supplies the function of the torpid emunctory. A source of vascular irritation will thus be created; for it cannot be presumed that recrementitious matter, even in its elementary state, can long remain commingled with the blood, in inordinate quantity, without giving rise to more or less of morbid excitement. "Thus, if from certain causes elements entering into the composition of bile, abound in the blood, a source of disorder or of irritation is present in the blood. This irritating cause must act upon those parts which are sensible to its impressions, and to which it is incessantly and immediately applied. Derangement of the whole vascular system becomes the consequence of such irritation offered to the nerves ramified upon the heart and blood-vessels, but more especially in the organ destined to combine and to secrete under new forms, the materials now so abundantly presented to it."† Thus, too, if the cutaneous exhalation be arrested in consequence of the sudden influence of cold, a large portion of the recrementitious perspirable matter will be retained in the circulation. If this be not removed out of the system, by the vicarious action of some other organ, the blood will become surcharged with substances which the welfare of the economy requires to be cast off, and which must necessarily impart to it a morbific or irritating quality. This circumstance, together with the internal congestions which usually attend torpor of the cutaneous exhalents, becomes a direct source of irritation to the heart and arteries, and consequently of febrile excitement.

With all the evidence which we possess, therefore, that the blood frequently becomes charged with substances of an irritating or deleterious character, there can, surely, exist no reasonable doubt, that fever is sometimes the result of direct and primary irritation of the heart and arteries; for it will not be denied, that agents which are capable of causing morbid impressions on the nerves of the skin, the alimentary canal, or of any other organ, will be equally capable of producing irritation in the heart and arteries, when brought in immediate contact with their internal surface; and no one, certainly, will maintain, that irritating impressions made upon the whole or a part of the internal surface of the vascular system, will not be as likely to excite that morbid vascular action which constitutes fever,

* Dr. James Johnson, the very able editor of the Medico Chirurgical Review, observes—"It has always been our opinion that febrific causes made their first impressions on the nervous system; but this, we think, does not disprove that absorption first takes place—still less that absorption is not necessary at all."—*Med. Chir. Rev.*

† London Medical Repository, No. 102, p. 509.

as when the irritation is conveyed to this system sympathetically, from some remote local inflammation.*

Evident, therefore, as it unquestionably is, that fever may, and often does, arise from morbific impressions made *primarily* on the vascular system, it is nevertheless equally manifest, that it is, perhaps, still more frequently the result of a purely *sympathetic* irritation, proceeding from local irritation or inflammation pre-established by the febrific cause. This latter mode of febrile origin is, according to some modern pathologists, the only possible way in which fevers can arise; as if morbific impressions made *directly* upon the blood-vessels, could be less apt to derange their functions than when *communicated* to them sympathetically through the medium of the nerves. It is probable, however, that the primary morbid condition whence the sympathetic febrile actions emanate, consists much more frequently in mere irritation of functional derangement than in actual inflammation. I presume that those febrific causes which do not make their impressions directly on the lining membrane of the heart, arteries, or capillaries, by being admitted into the circulation, cause, in the first place, irritation and consequent functional derangement in one or more important organs or structures of the system. In consequence of this local irritation or deranged action, the equilibrium of excitement and of the circulation becomes disturbed, the vital properties deranged, and the sanguiferous system is finally brought into a state of febrile reaction.

Fever, as has already been observed, always, perhaps, commences by a local irritation, or morbid excitement. Even when the disease results from causes that act immediately on the internal surface of the vascular system, the irritation, or primary morbid excitement, is probably confined, at first, to a comparatively small portion of this system. Every agent, whether morbific or medicinal, appears to have a tendency, in its ulterior operation, to affect particular organs or structures in preference to others. On whatever part of the system the primary impression is made, the excitement produced is chiefly conveyed to some particular organ or part, according to the peculiar character of the primary impression. Ergot, whether received into the stomach, or injected into the rectum, produces an excitement in the nerves of the part to which it is applied, which is especially conveyed to the gravid uterus, and, so far as can be perceived, to no other part. The infusion of jalap, introduced into the circulation, will act upon the alimentary canal, and produce purging; cantharides, whether taken into the stomach or applied to the surface, is apt to inflame the neck of the bladder; and in short, the influence of almost every agent appears to possess a kind of elective affinity for some particular organ or structure of the organization. That this should be the case, might, indeed, be inferred from physiological principles, independent of the evidence of experience. That each organ and structure of the animal system is endowed with a peculiar modification of the vital properties, may be regarded as an established fact in physiology. In this principle we may perceive the reason why different agents manifest peculiar tendencies to act on different parts of the system. Without doubt, when an impression is made on the system, it will be most felt by that structure whose specific or peculiar vital properties are most in relation with it. When an impression is made on the nervous extremities of any part of the body, the excitement produced is

* [Although Cullen allowed that the fluids underwent morbid changes in fevers, he maintained that they were the consequences, not the cause of disease. Of late an attempt has been made to revive the humoral pathology, by a more accurate chemical examination of the blood, and by experiments of injecting morbid and irritating matters into the circulation. The facts which have been ascertained certainly show that a morbid state of the blood may perform an important part in developing some of the phenomena of fever. But they do not warrant the conclusion of some of the European investigators, nor of Dr. Stevens, of the West Indies, that fever is entirely dependent upon such a cause. The saline treatment of Dr. Stevens has not as yet got into credit with the profession; nor has the practice of medicine been at all modified by the recent advance of humoral pathology.—Mc.]

conveyed by the nerves to the brain, and from this organ it is reflected or radiated throughout the whole nervous system. That this is the ordinary course of nervous excitement from impressions made on the sentient extremities, will scarcely be disputed by any one who has carefully attended to the functions of the brain and its appendages. It is impossible to give a rational explanation of many sympathetic phenomena, unless we trace the course of nervous excitement from its origin to the brain, and thence to the part which manifests the sympathetic action. If, then, each organ and structure of the animal system be endowed with its peculiar modification of *excitability*,* we may justly presume that some parts of the organization will be insensible, whilst others will be more or less sensible to particular impressions, and consequently there will be some parts in which a new excitement will be produced by the impressions reflected by the sensorium commune, whilst in other organs and structures no immediate effect will be produced. Thus, if tartar emetic be kept in contact with the external region of the stomach, the impression which it causes will be conveyed to the brain, which, in its turn, will reflect the impression throughout the whole nervous system; but as the stomach alone is endowed with a mode of feeling capable of receiving this peculiar impression to a prominent degree, it will be in this organ that its effects will be most conspicuous.†

Let us suppose, then, that a febrific agent acts primarily upon the nerves of the stomach or of the skin, or of any other part of the body. The impression produced, will be conveyed to the sensorium commune, whence it will be reflected throughout the whole nervous system. But as the various organs and structures of the system are endowed, each with its own peculiar modification of the vital properties, some may be insensible, whilst others, perhaps, are peculiarly susceptible of receiving and responding to the reflected morbific impression; and these, it may be reasonably presumed, will be irritated and functionally deranged, before the other organs or structures become affected. From the part thus primarily irritated, the morbid excitement passes from organ to organ, or tissue to tissue, according to their various sympathetic relations with each other, and with the part primarily affected, until the whole system becomes morbidly excited.

It is extremely improbable that the morbid excitement or impression caused by a febrific agent, can ever bring every part of the system, simultaneously, or *pari passu*, into a state of morbid action. The direct influence of the remote or exciting causes of fever, do not, probably, extend beyond the simple impression which they make on the sentient extremities. Every subsequent morbid change in the development of fever, must depend wholly on the relative affinities of the various structures with each other, and with the character of the primary impression; and, from what has been said above, it can scarcely be doubted, that the primary impression or nervous derangement, resulting directly from the action of the morbific cause, always terminates in the production of prominent morbid excitement in some particular organ or structure preliminary to the actual development of the general febrile vascular reaction.

* The word excitability is here used to express the power of being excited into action, and includes both sensibility and contractility.

† The author of a Review of the first edition of this work, doubts the correctness of this assertion. It must be admitted, that tartar emetic, when applied to the external surface, very rarely produces either nausea or vomiting. I have, nevertheless, met with one remarkable instance of this kind. At three different periods a solution of this article was applied to the epigastrium, and at each time he experienced very distressing and protracted nausea. The general fact, however, which it is intended to illustrate by the above observation, cannot be disputed. It is well known, as has been observed in the preceding page, that to whatever part remedial substances are applied, they manifest the same tendency to act on particular organs or structures, as if they were taken into the stomach. I have known tobacco applied to the feet to give rise to nausea and vomiting, and every physician must have observed similar facts. [I have repeatedly observed this fact; tartar emetic plasters occasionally produce severe vomiting in irritable patients.—Mc.]

That the primary morbific impressions are, however, almost universally directed upon the mucous membrane of the alimentary canal, as is asserted by Broussais, appears to be as far from truth, as that all fevers are purely symptomatic. Almost every organ or structure of the system may, without doubt, be the first to suffer functional derangement or irritation from external morbific impressions. The lungs, the liver, the brain, or the skin, &c., sometimes receive the reflected impressions, and become the primary focus whence the febrile actions emanate. Observation, moreover, discountenances the opinion that the primary local derangement thus produced, amounts often to the grade of inflammation. Deranged or irritated excitement of an organ or structure may be adequate to set on foot a train of morbid changes which will ultimately terminate in febrile reaction. A draught of cold water, while the body is in a state of free perspiration, may, in its ultimate consequences, establish fever. In this case the impressions of the cold water on the nerves of the stomach, are transmitted through the medium of the sensorium commune, to the cutaneous exhalents and capillaries. A state of torpor and functional derangement of these vessels, together with the deranged sensibility of the cutaneous nerves, immediately ensues, and the patient experiences a sense of chilliness, with more or less constriction of the extreme vessels. These, then, are the first sympathetic phenomena arising from the influence of the remote or exciting cause; and from these morbid changes, others proceed in regular sequence until the fever is fully developed. Thus, from the torpor of the exhalents and diminished circulation in the external capillaries, three pathological conditions necessarily arise, which tend especially to excite febrile reaction. In the first place, a large portion of recrementitious perspirable matter will be retained in the circulation; secondly, the retreat of the blood from the extreme vessels will cause it to accumulate in the heart and large internal vessels; and thirdly, the action of the liver* and other internal organs, will be more deranged in consequence of their direct sympathetic relations with the cutaneous exhalents.

But although the organs which sustain the primary irritation—and from which the morbid febrile changes are diffused throughout the system, as from a centre, are not, perhaps, at first in a state of actual inflammation, yet, as they are already morbidly irritable and irritated, they will be especially apt to pass into a state of complete inflammation soon after the febrile reaction is established, and an increased momentum given to the blood. It may be observed, too, that when a morbific cause acts directly on the stomach, as in the example just assumed, the fever will be apt to become early complicated with conspicuous irritation or inflammation of the mucous membrane of this organ; in consequence of having sustained the direct injurious impressions of the remote cause, and consequently, being, from the very onset of the disease, in a morbid condition.

It must be remembered that inflammation consists not only in congestion of the inflamed capillaries, but also in an altered or morbid condition of their vital properties: and hence, when an organ is already in a state of morbid excitement or irritation, inflammation will very readily ensue, when, by a general increased momentum of the circulation, the blood is urged into the debilitated and morbid capillaries. It is on this account that we so often find inflammation supervening in the stomach and intestinal canal in fevers. The mucous membrane of these organs being so much exposed to the action of irritating causes, is far more frequently the seat of irritation than any other structure of the system, and it is almost invariably in a more or less deranged condition in all general diseases. This being the case, it is evident that this structure must be especially liable to secondary inflammation in febrile affections; and this, in fact, is fully confirmed by experience.

Inequilibrium of the circulation and excitement is one of the most important

* Vide Johnson on the Diseases of Tropical Climates. Of the correctness of his sentiments concerning the influence of what he calls the cutaneo-hepatic sympathy, I entertain no doubt.

characteristics of fever. Although fever is emphatically a general malady, and a morbidly excited condition, it must not be supposed that every sensible and irritable structure, though functionally deranged, is in a state of increased excitement. While the heart and arteries are energetic, and morbidly active, the muscular system is usually languid and enfeebled. An increased activity of the intestinal capillaries and exhalents may be attended with diminished activity of the capillaries and exhalents of the external surface. Inordinate action of the kidneys is often accompanied with torpor of the liver, and always with torpor of the cutaneous exhalents. Sometimes the capillary system is inordinately active, whilst the heart and arteries manifest but little or no increase of excitement; and occasionally the brain and nerves are in a state of great activity, with very feeble reaction of the heart and arteries. The same observations apply to the distribution of the blood. Whilst it is morbidly deficient in some organs, it will be excessively abundant in others; whilst the capillaries of one structure or organ are engorged and inflamed, those of other parts will be devoid of the regular portion of the circulating fluid. These facts have a most important bearing on practice; for they point directly to the fundamental principle of treatment—namely, to excite and invigorate those organs that are torpid, at the same time that we depress and debilitate those that are morbidly active.

It has been supposed that febrile excitement, or the essential morbid action of fever, is always the same; and that the various modifications which this form of disease is known to assume, depend wholly upon the local irritation or inflammation which may occur, or rather the organ or structure which may be its seat. To a certain extent, this opinion appears to be well founded. It is very evident, for instance, that in proportion as the brain and nerves become affected, so will the fever acquire a low or typhoid grade in its general character. Of two individuals seized with fever from the influence of atmospheric vicissitude, one will, perhaps, be affected with a low or typhoid form of fever, whilst, in the other, the fever will assume a high grade of inflammatory or synochal reaction. In the former, prominent symptoms of severe nervous disorder will attend; and if the disease be violent, decided manifestations of cerebral inflammation will probably occur. In the latter case, little or no prominent signs of cerebral disturbance or irritation will ensue; but instead of this, symptoms of local inflammation in the fibrous or serous structures, or in one or more of the abdominal organs, will probably be observed.

That the occurrence of irritation or inflammation of the brain should impart a low and typhoid character to fever, and thus give to it a peculiar aspect, is by no means difficult to comprehend; for it is manifest, that when the fountain of the vital energies, the brain, is prominently deranged, all the powers of life, however excited, must languish and sink. This subject will, however, be more particularly discussed under the head of continued fever, being referred to at present merely for the purpose of directing the reader's attention to the general fact, that fevers, arising from the same cause, and essentially identical, receive important modifications from the seat and grade of the local affections which may supervene.

The mode in which the occurrence of local inflammation may be favoured during the progress of fever, has already been mentioned. Besides the peculiar influence of the remote causes, in deranging particular organs or structures, in preference to others, and thus laying the foundation for local inflammation, there are, however, other circumstances which are, perhaps, still more commonly concerned in favouring the supervention of inflammation, and inviting it to particular organs. The human system is rarely found in so perfect a state of health, that some of its various organs or structures are not more or less debilitated or disturbed. The multifarious influences that are continually operating on the animal economy, do not suffer the vital machine to go on without some, though often imperceptible, derangement in one or more of its various organs. Add to this, the congenital debility of some structures, and the constitutional prepotency

of others, and we have a sufficient number of latent causes, (varying in different individuals, and in relation to some, in the same individuals at different periods,) to determine the occurrence of local inflammation, when the nervous and vascular systems are thrown into a state of tumultuous excitement.

Much variation occurs in different cases, as to the period after the commencement of the febrile changes, when local inflammations of this kind supervene. If any organ or structure happen to be especially predisposed to inflammatory excitement, or when the exciting cause is of such a nature as to act with great force upon some organ or structure, inflammation may commence with the onset of the febrile vascular reaction. More commonly, however, the local inflammation does not supervene until several days after the commencement of the fever; and in many instances, not until the latter period of the disease. The occurrence of local inflammation in general fevers, of course always greatly increases the obstinacy and danger of the disease; and this is pre-eminently the case, when such inflammations supervene in fevers of typhoid character.

Prone, as febrile affections unquestionably are, to give rise to secondary inflammations, many instances occur which remain entirely free from inflammation throughout the whole course of the malady, although irregular determinations and inequilibrium of excitement appear to be inseparably connected with this form of general disease.

It has been observed above, that fevers, essentially identical in the nature of the general febrile excitement, often assume prominent modifications, apparently radically diverse from each other, in consequence, solely, of the different organs or structures which happen to sustain the principal force of the malady. From this unquestionable fact some pathologists have inferred that there can be fundamental and specific diversities of fever, presuming that the general febrile excitement is always essentially the same; and that all the diversities which occur in the course and phenomena of this mode of disease, are invariably the result of the diverse local affections that may accompany the malady. It appears to me, however, that the occurrence of original and specific diversities in the nature of febrile excitement, is susceptible of very plausible, and, to me at least, sufficiently satisfactory illustration. It is impossible to conceive why the capillary system of blood-vessels, in which doubtless all the essential febrile actions reside, should not be as susceptible of radical diversities of excitement as the nervous system itself. Upon this point we may be allowed to refer to the exanthematous affections; for, whatever Broussais and his followers may say to the contrary, some of these diseases are, at least in the first stage, simply febrile, without local inflammation. In the general phenomena of the fever of distinct small-pox, during the first day of its course, there is nothing that is different from an ordinary synochus, and yet no one can for a moment seriously doubt, that the essential morbid excitement of the extreme vessels in this affection, is specifically distinct from that of all other febrile diseases. It is true that this disease is produced by a specific cause; but the morbific impressions made by *malaria*, are probably as distinct from those of cold, as the impressions of small-pox virus are from those of either of them. No one has ever observed yellow fever or the plague to arise from atmospheric vicissitudes; and *malaria* by itself has, I presume, never been known to give rise to inflammatory rheumatism, or to simple catarrhal fever. If, then, in relation to the exanthemata, general febrile excitement is unquestionably susceptible of radical and specific peculiarities, the possibility of such fundamental diversities in the nature of the morbid excitement of fever, independent of accidental local affections, must be admitted even in the general fevers usually denominated idiopathic. It is probable that *koino-miasmata*, *idio-miasmata*, and *cold*, or atmospheric vicissitudes, produce each its peculiar mode of morbid excitement; for, although the general and obvious febrile actions, and even the accompanying local affections which they respectively produce, may not be perceptibly diverse, yet, it may be presumed, the fundamental morbid condition or excitement of the nervous and capillary systems, upon which the

febrile phenomena depend, is, in each variety of fever, radically distinct, or *sui generis*. So far, however, as the fevers occasioned by one or the other of these remote causes, differ in form and general character from each other—as, for instance, the various forms of miasmal fevers—it can scarcely be doubted, that the most common source of these diversities consists in the accidental local affections which occur, or the character of the structure most prominently deranged, or the greater or less intensity of the operation of the remote cause.

CHAPTER II.

OF THE CAUSES OF FEVER.

The causes of fever are generally divided by pathologists into *two* varieties, the *predisposing* and the *exciting*. The former are all those external and internal causes which tend to lessen the power of vital resistance to the influence of morbific agents. The latter are those causes which excite actual disease by the deleterious or irritating impressions which they make on the animal system. There exists, however, no absolute difference in the nature or character of these two varieties of morbific causes. The same agent, or circumstance, may manifest its influence on the animal economy, either as a *predisposing* or an *exciting* cause of fever, according to the degree of intensity with which it acts, or the previous condition of the system.

Sect. I.—*Of Predisposition, and Predisposing Causes.*

When, either from a general condition of the organization, or some local, functional or organic defect, the animal economy is especially susceptible of the influence of morbific causes, a *predisposition* to disease is said to exist; and this predisposing condition may be either *natural*, or *accidental*, or *hereditary*.

As the human system is continually under the influence of causes which have a tendency to interrupt and terminate its actions, life would be but ephemeral in its duration, and harassed by constant disease, if the animal organization were not endowed with the inherent power of resisting, to a degree, the influence of injurious causes. It is by the aid of this vital resistance, that man is enabled to live through a long series of years, amidst a multiplicity of causes, which conspire unceasingly to his destruction. In relation to the degree in which this power of resisting injurious influences is possessed by different individuals, there exists great diversity: and hence the various degrees of constitutional or natural predisposition to fever, which obtain among different individuals. Thus, the prick of a needle will, in one individual, cause great pain and constitutional irrition; in another, syncope; in a third, convulsions or tetanus; and in a fourth, scarcely any perceptible consequences at all.* There exists, therefore, a natural or *constitutional* predisposition to disease in some individuals, wholly independent of accidental causes or mere casual debility; and this constitutional aptitude to disease depends, probably, on the peculiar organization of the animal system.

Under the head of natural, or constitutional predispositions, must be ranked those *specific* predispositions which render the system susceptible of certain specific diseases, and which are wholly lost by the actual occurrence of these maladies. These specific predispositions are especially incomprehensible and

* Sur le differens Dégrées de Resistance vitale dans les Maladies, &c. Par M. L. Martinet, M. D.—*Revue Médicale*, Oct. 1824.

mysterious. Neither temperament, nor constitutional vigor, nor debility, nor any circumstance connected with the health of the individual, appears to have any relation with, or influence upon them.

With regard to *accidental*, or acquired predisposition, observation has not left us so entirely in the dark. According to the late Dr. Rush, general or local debility, accompanied by an increased excitability, constitutes the state of predisposition to fever. Without doubt, general debility, with increased excitability, must render the system more liable to the action of irritating or exciting causes; yet it does not appear that this condition of the system can, with propriety, be considered as constituting the essential state of the organization which predisposes to fever. It is well known that the most robust and healthy individuals are generally the first and most certain victims of febrile epidemics. The vigorous and healthy are often prostrated under the devastating dominion of pestilence, and even under the less ruthless sway of the milder paludal fevers, whilst the feeble and the valetudinarian pass along untouched. It may, moreover, be observed, that in the feebleness of convalescence from bilious, typhus, and other forms of fever, fresh attacks, or relapses, are by no means so common as one would expect, if mere debility constituted febrile predisposition. When we wish to obviate fever, after a surgical operation, we reduce the system by a low diet, purgation, and perhaps blood-letting.*

In a general way, every cause, capable of deranging the health of the animal economy, may, when acting with moderate force, produce such a change in one or more organs, as will predispose the system to fever, requiring only some further exciting cause to evolve actual febrile disease. Predisposition, produced by the influence of accidental causes, consists, probably, always in more or less functional derangement of one, or, at most, a few structures or organs, or in a disturbance of the healthy balance of excitement and the circulation. I have already stated some reasons which render it highly probable that the impression of every morbific cause, on whatever part of the system primarily made, is, in the first place, reflected upon some particular organ, according to the nature of the impression, and the organic sensibility of the various parts of the system. If this be correct, it is manifest, that if the morbific impression, thus reflected upon an organ or structure, be too weak to establish a sufficient degree of irritation to excite general derangement, or febrile reaction, the result will be only a slight degree of insulated functional derangement, or irritation, which, though not manifested by any feelings or appearances of ill health, is still an incipient link of disease, and wants only some additional morbific influences to enable it to put in motion the latent train of morbid sympathies. How greatly mere functional derangement of an important organ aids the cause of fever in developing diseases, is often conspicuously illustrated by the influence of digestive derangement in the production of fever. Let but this citadel of the animal system languish, and the enemies of human health will speedily attack the outposts, and make an easy conquest of the whole. Hence, of all the precautions which those who visit insalubrious climates may be required to adopt, the avoidance of everything which is calculated to derange the digestive functions, is perhaps the most important.

By a well-known law of the animal economy, every agent, however deleterious, gradually diminishes, and finally almost destroys the susceptibility of the system to its influence, by long-continued or very repeated action. Hence, every agent will, *cæteris paribus*, manifest its operation with a promptitude and intensity, proportionate to the degree of previous immunity from its influence. It is this circumstance which causes the difference of predisposition to endemial fevers, between the acclimated natives of insalubrious regions, and strangers arriving from northern latitudes. This variety of predisposition depends in no degree on a want of constitutional vigor or general health. The robust and healthy

* Richter's Specielle Thérapie, vol. i. p. 36.

are, in general, as much, if not more, under its influence, than the weak and infirm. By a gradual or protracted exposure to morbific agents, the animal economy loses, insensibly, its natural susceptibility to their influence. When such a change is effected by the combined operation of climate and endemial morbific agents, the system is said to be acclimated or seasoned, and the individual, thus seasoned, enjoys a comparative immunity from the diseases of the climate.

Besides the foregoing source of predisposition to disease, from causes peculiar to hot climates, there is another and perhaps not less powerful one—namely, *atmospheric* heat. High atmospheric temperature is, strictly speaking, rather a predisposing than a morbific agent in relation to its influence on the human system.* In this respect it exercises a very powerful influence in the production of diseases. Long-continued exposure to an elevated degree of solar heat, tends, very considerably, to increase the general irritability of the system, and to lessen the power of vital resistance. Hence, the frequency of tetanus in hot climates, from injuries, or from the influence of the cool and damp night air; and hence, too, the greater liability to this and other irritative affections, during the hot seasons of our own climate, than in the cold months. Atmospheric heat tends, moreover, to predispose to fever, and other affections, by the profuse and continued perspiration it causes, as well as the redundant secretion of bile it is apt to excite. By these over-excited actions of two important organs, the general system is exhausted, whilst the organs themselves are rendered more susceptible to the injurious impressions of one of the common and powerful exciting causes of disease—namely, *cold*.

In relation to those predispositions to disease which are transmitted from parent to offspring, it may be sufficient to observe, in this place, that they depend, no doubt, on a peculiar physical condition or intimate state of the organization, which, we may presume, is as apt to be imparted by the parent to the offspring, as the contour of the countenance, or of the general structure of the body.

Sect. II.—*Of the Sources of Morbific Causes, and their General Character.*

When we take a general survey of the source of all the possible causes of disease, we find that in relation to their origin, they range themselves under the following four general heads, viz:†

I. *Recrementitious substances*, which, in health, are separated and thrown out of the system, but being retained in the circulation, or reabsorbed, become a source of irritation to the sanguiferous system, and, therefore of irritative diseases. These morbific causes are always *secondary*, being themselves the consequences of an anterior injurious cause or impression. Thus the retention of the perspirable matter can occur only in consequence of the influence of some previous cause, adequate to disturb or arrest the action of the cutaneous exhalents. The recrementitious fluids, which appear to be most injurious to the animal economy, when retained in the circulation, even in their elementary forms, are the perspirable matter, the bile, and the urine; and of these the first is, perhaps, the most frequently concerned in the production of disease. The influence of causes of this kind in the development of disease, is, probably, much more extensive than is generally admitted in etiological inquiries. In all that extensive class of febrile affections which arise from the influence of cold, retained perspirable matter performs, probably, a principal part in the development of the irritative vascular excitement.

Checked perspiration, or, more correctly speaking, inactivity of the cutaneous exhalents, constitutes the initial link in, perhaps, three-fourths of our febrile dis-

* Dr. James Johnson on Tropical Climates, &c.

† Richter's Specielle Thérapie, vol. i.

eases. Let it not be imagined, that, as the recrementitious substances which are retained in the circulation are in a simple or elementary state, they cannot possess powers sufficiently irritating or active to excite morbid vascular action. In whatever form these substances may exist in the blood, they are still recrementitious, and it is not to be presumed, that materials of this character could be long retained without an injurious influence on the animal economy. Accidental torpor of one emunctory is often vicariously supplied, by increased activity of another, and disease thus prevented. Thus if, after the cutaneous exhalents have been rendered torpid by a sudden influence of cold, the flow of urine becomes unusually copious, disease will rarely ensue. Indeed, the ALL-WISE and BENEVOLENT CREATOR has provided against the injurious consequences which must otherwise have resulted from the constant changes to which the function of the skin is necessarily exposed, by placing in the interior an organ whose functions may, in a great degree, supply any accidental deficiency in the action of the former.

II. *Irritating substances generated within the body, but wholly independent of any organic actions.* These causes of disease are usually generated in the primæ viæ, and consist of worms, acids, mucus, and various other irritating substances, resulting from the fermentative or putrefactive processes.

Worms have been, and by some are still considered as innocent inmates of the human body. This, however, is most certainly an erroneous sentiment. Without doubt, a few, or even a considerable number of worms lodged in the alimentary canal, may not be able to disturb the general system, when in a state of good health and constitutional vigor; but when the body is debilitated and irritable, as it commonly is during the period of dentition, the presence of worms in the intestinal tube will frequently give rise to the most alarming affections. Worms tend, moreover, to sustain and protract fevers produced by other exciting causes; an inattention to which frequently renders the progress of ordinary diseases peculiarly perplexing and unmanageable. It is not uncommon to meet with cases of slight febrile disease in children, from cold, which continue in spite of appropriate remedial efforts, gradually assuming the form of slow remitting fever, with a foul tongue, and gastric disturbances, and at last suddenly assume a favorable aspect, on the expulsion of a few large lumbrici.

The agency of causes of this kind in the production of *fever*, was, however, formerly considered much more extensive than it appears, in reality, to be. Verminous epidemic fevers are described by some of the older writers, and saburral fevers were supposed, as it would appear, very common. Without ascribing so great an importance to these causes, as *originators* of fever, it is nevertheless unquestionable that they do at times give rise to febrile affections, independent of all other morbific irritants. Their febrific tendency is, however, much more frequently manifested in the support, or additional violence which they give to fevers arising from other causes, than in originating febrile affections by their own immediate influence.

III. *Morbific agents, generated out of the animal body*, consisting either of deleterious substances floating in the air, or of the sensible properties of the atmosphere, or finally mechanical causes—namely: miasmata, noxious gases, heat, cold, electricity, humidity, and mechanical injuries, &c.

IV. The fourth and last class of morbific agents comprehends those which are *generated by morbid organic actions of the living system, constituting the various contagions.*

The principal causes, embraced under the last two heads, are so extensive in their influence on the human system, and so interesting and important, both in a medical and scientific point of view, that a separate and full exposition of their respective modes of origin, and physical, as well as morbific characters, will not be deemed inappropriate in a work of this kind.

Sect. III.—*Atmospheric Temperature, and its relations with the Animal System.*

A certain quantity of heat is indispensable to life, throughout the whole range of organized beings. Every animated being possesses an inherent power to generate heat, and to resist, to a certain extent, the physical law of the distribution of heat; and, consequently, to maintain its peculiar or specific temperature, when placed in a medium either many degrees below or above its own temperature. The constant and rapid reproduction of heat by the vital powers, keeps up the natural temperature of the animal body although surrounded by a medium which abstracts its heat with great rapidity. Such, indeed, is the evolution of heat by the human body, that an atmosphere of the temperature of 98° is generally oppressive and unpleasant by the feeling of warmth which it causes, although at this temperature of the air, no heat can be communicated by the surrounding atmosphere to the body. The temperature most grateful and invigorating to the human system, ranges from about 60° to 65°. "This temperature of the air appears to abstract the heat of the body in about the same proportion in which it is generated in the healthy state of the system; and this degree of the temperature is, therefore, the most congenial, for it neither exhausts the vital powers, nor gives rise to unpleasant sensations."

There exists, however, considerable diversity in the human constitution, in relation to the power of supporting the extremes of temperature. This depends not only on the original vigor of the system, but also, greatly, on the influence of habit and modes of living. A person endowed with a vigorous constitution, and with habitual good health, will bear a degree of cold without any unpleasant feelings, which, to one of a feeble and exhausted system, will be a source of painful sensations and indisposition. Habit, in relation to previous exposure, has a powerful influence in varying the effects of temperature on the animal system. The same temperature will cause feelings of severe cold or great warmth, according as the body has been previously exposed to a high or low temperature. Whenever the surrounding medium abstracts the heat of the body more rapidly than it is generated by the regular actions of the animal economy, the sensation of cold will be produced: and the intensity of this sensation will always be proportionate to the *rapidity* with which the heat is abstracted, and the feebleness of the heat-generating power of the system.

I. *Physiological effects of cold.*—When the temperature to which the human system is exposed, is so low as to give rise to the sensation of *cold*, its immediate effects are: 1. *Diminution of the action of the cutaneous exhalents*, and of the external capillary blood-vessels, giving rise to a pale, shrunken, and dry state of the skin; 2. *Diminished action of the heart and arteries—manifested* by smallness, weakness, and *slowness* of the pulse. In relation to the effects of low temperature on the *frequency* of the pulse, however, there exists some discrepancy of opinion among physiologists. From the experiments of Drs. Stock, Spooner and M'Donnel, it would seem, that although the strength and size of the pulse are diminished by cold, yet its *frequency* is considerably increased. Against these experiments we may oppose those performed by Currie, Rush and Klapp;* and in my own experiments I have invariably found the pulse diminished, both in frequency and in volume, when cold was applied to any parti-

* That Dr. Stock and the other experimenters observed what they record upon this point, cannot be doubted. We can readily admit that when the body is suddenly plunged into cold water, the mode adopted by them, the pulse will at first be accelerated. It must be observed that when the body is *suddenly* immersed in cold water, the blood is violently driven in upon the heart and larger vessels, and the respiration is performed in a hurried and imperfect manner, in consequence of which, the heart is excited into a temporary exertion to overcome the load which oppresses it, and the pulse consequently at first accelerated.

cular portion of the body.* 3. *Diminished sensibility* of the external parts, passing by degrees throughout the whole system. Hence the benumbed state of hands, fingers, and other external parts, the torpor of the sensorial functions, and the sluggishness and feebleness of muscular action which occur from the protracted influence of severe cold; and in this way, too, an almost irresistible inclination to *sleep* occurs when the cold is very intense. Artificial somnolency has been produced in certain animals by exposing them to a very low degree of temperature. 4. When moderately applied, cold *increases the powers of the digestive organs.* Hence the aphorism of Hippocrates, *Hieme ventres calidorus sunt.* The appetite increases, and the process of digestion is performed more rapidly in moderately cold and dry than in warm weather. We are informed by Xenophon, that the Greek soldiers, on their return from Asia, were exceedingly harassed by the most severe sensations of hunger, while passing the snow-covered mountains of Armenia, although they were allowed their ordinary rations of food. When cold becomes very intense and protracted, however, the digestive as well as all the other organs of the system become enfeebled and inactive. 5. The *sudden* application of cold causes a hurried, irregular and imperfect action of the respiratory apparatus; and when intense, it checks or impedes the efforts to dilate the chest, and these effects increase, *pari passu*, with the increased influence of the cold, until at length respiration is performed so imperfectly as to prevent the due decarbonization of the blood, and the whole organization sinks into a state of torpor and insensibility. 6. *Moderate cold is favorable to nutrition.* "Man and all animals are fatter in winter than in summer; and in the north than in the south." When, however, the cold is applied in an intense grade and prolonged in its influence, the process of nutrition is disturbed and interrupted. 7. The pulmonary exhalation, and the secretion of urine are increased by cold, and supply, in a degree, the checked exhalation by the skin from the same cause.

Stringuntur tubuli pellis, coguntur et intus
Tott variis pellenda viis excreto, &c.

8. Cold, when prolonged in its influence, diminishes the *venereal propensity*, (Montesquieu, *Esp. des Loix*, b. 14, c. 2,) but it does not appear to repress the function of generation; for although the venereal appetite be less constant and urgent in cold than in warm climates, yet the power of procreation would seem to be even greater in the former than in the latter. "In Sweden it is not uncommon to see women have twenty or thirty children; and in Russia marriages are followed by a numerous progeny."† 9. Cold retards the development of the sexual organs, and the period of pubescence, more especially in the female sex. In northern latitudes the catamenia rarely commence before the sixteenth or seventeenth year, whereas in the ardent climates of the intertropical countries, the menstrual evacuation is apt to make its appearance as early as the twelfth, and not unfrequently as early as the tenth year of age.

Cold is, therefore, a sedative agent; for, although, when moderately and transiently applied, it is generally followed by phenomena attributable to a stimulating influence, yet these are not, strictly speaking, the *immediate* consequences of the low temperature, but rather of the *reaction* of the *vital energies*, after the temporary reduction of their activity by the cold. When an agreeable glow, and

* The pulse of the inhabitants of northern climates is habitually slower than the ordinary standard of frequency in the middle latitudes. Amongst the Greenlanders, it is by no means uncommon to find the pulse as slow as 40 and 45 in a minute.—*Beaupré on the Effects and Properties of Cold*, p. 50.

† Beaupré on the Effects of Cold, &c., p. 18. "In the coldest regions, approaching the poles, excessive cold retards the generative flame, and, we may say, extinguishes the lamp of physical love. Beyond the 65th degree of latitude, population continues to decrease, and ends at Spitzbergen and Nova-Zembla. Lapland and Iceland females are said to menstruate but little; they are apathetic in love, and know but little of the bitter feelings of jealousy, or the vehemence of sexual attachment."

augmentation of the general vigor are experienced after leaving a cold bath, they arise, probably, not from the direct stimulus of the cold, but from its having depressed the excitement of the surface, and increased the susceptibility to the action of stimuli; in consequence of which the ordinary influence of the atmosphere, the warmth of the clothing, and even the stimulus of the blood, as well as exercise, and other usual exciting influences, will cause an increased degree of excitement, more especially in the cutaneous capillary system. That the phenomena of increased activity and vigor, which sometimes ensue, are solely the consequence of a *reaction* in the system, after the cold has temporarily diminished the excitement, and thereby increased the susceptibility to subsequent excitation, is fully demonstrated by the fact, that unless the system be endowed with a considerable degree of energy and activity, no such favorable effects will follow the application of cold. If cold produced these effects by its *stimulating* powers, it would, one may reasonably believe, produce them when the system is in a *state of feebleness;* because mere weakness can never annul the operation of a stimulus, provided the excitability be not exhausted. That cold must necessarily diminish the actions of the system, is evident from its being, in fact, nothing else than a comparatively diminished grade of temperature. For if heat be a stimulus, it is manifest that this stimulus must be lessened in its powers, just in the ratio in which its intensity is decreased. Thus, if 80° produce a certain degree of excitation, 60° (*cæteris paribus*) must produce a less degree and 40° still less, and so on. Correctly speaking, every agent capable of affecting the animal economy, is a stimulus; but when we speak of cold and its effects, it is to be always understood in a relative sense; for when it is said that cold is a sedative, it can mean nothing else than that it is less stimulating than a higher degree of temperature.

It is to be observed, however, that although cold unquestionably tends to diminish the actions of the system, yet, when applied suddenly, it often manifests a very conspicuous exciting agency on the nervous or sensitive system. Thus, a few drops of cold water sprinkled on the face of a person in a state of syncope, or approaching to this state, will generally produce immediate excitation and return of consciousness. In asphyxia from carbonic acid, or electricity, too, cold water dashed on the face and breast, often causes immediate respiration and other manifestations of returning life. In cases of this kind, the sudden *sensation* which the cold produces, acts, probably, as the exciting cause.

II. *Cold as a morbific agent.*—Cold is, perhaps, the most common and frequent of all the remote causes of diseases in the temperate latitudes. Its injurious tendency appears to be much enhanced by being conjoined with humidity; for, a very *dry* and cold air is far less capable of abstracting the animal temperature than low temperature united with humidity. But the most important circumstances which render the impressions of low temperature prejudicial to the animal economy, relate to the previous condition of the system itself, with regard to the cutaneous transpiration, and antecedent exposure to high temperature. The morbific influence of cold is always efficient in proportion as the body has been previously exposed to an elevated temperature; and, more especially, in proportion as the perspiration is more or less copious. The most powerful of all the predisposing conditions of the animal system to the injurious effects of cold, is a state of free perspiration, from fatiguing and exhausting exercise or labor, under the influence of high solar heat. In this state of the body, and scarcely in any other, the sudden application of cold to a large extent of the surface, or to the stomach, in the form of ice or cold water, will often suddenly produce the most alarming, and even fatal, consequences.* When the animal temperature is not rapidly carried off by free perspiration, and the system not debilitated by fatigue, cold can never give rise to such sudden, violent, and dangerous consequences. The effects here alluded to, as resulting from the impres-

* Rush's Medical Inquiries. Currie's Medical Reports.

sions of cold, while the body is in a state of free perspiration, from fatiguing exercise and atmospheric heat, appear to be of a nervous or spasmodic character, consisting generally in sudden prostration and effacement of the vital energies of the system. As a *febrific* cause, cold plays a very important part in the production of disease. It is not, however, merely as *cold*, or low temperature, that it is most influential as a febrific cause; *vicissitudes of temperature*, sudden changes from warm to cold, or from cold to warm weather, are the sources whence febrile disease is so abundantly derived: and these changes are always injurious in proportion to the suddenness of the transition, and the greatness of the change. A very gradual change of atmospheric temperature rarely produces disease, except in such as are peculiarly predisposed to influences of this kind. The mode in which cold produces fever has already been explained. Its first effects on the system are torpor of the cutaneous exhalents, and a retreat of the blood from the surface to the internal organs. The recrementitious perspirable matter is thereby retained, and the blood rendered more irritating, or at least, surcharged with offensive substances. In consequence of these morbid conditions, the heart is excited into increased action, by which the blood is again propelled into the external capillary system, without, however, overcoming the torpor of the exhalents. If any portion of the capillary vessels be predisposed, by previous debility, to morbid excitement, high vascular irritation will be apt to occur in this part, and probably to the extent of actual inflammation. Should the mucous membrane of the respiratory passages be predisposed to irritation, catarrhal or pneumonic affections will be the consequence. If the alimentary canal be in a state of accidental or habitual irritation, dysentery or enteritis will probably occur. In short, whatever part of the system may be in a condition peculiarly predisposed to disease, inflammation or high vascular irritation will most likely be developed in it, by the increased momentum of the circulation, and the immediate local impressions of the recrementitious elements retained in the circulation.*

When the degree of cold is excessive, or very prolonged in its action on the animal system, it gradually abstracts the animal temperature to a degree incompatible with vital action, and *asphyxia*, *gangrene*, or *death* ensues. The tendency which very low temperature has to produce these effects, is greatly controlled by the degree of constitutional energy, as well as the degree of corporeal exercise, of those who are exposed to its prolonged influence. A person of a vigorous and healthy habit of body, will readily bear a degree of cold without particular injury, which would soon destroy an individual of a weak and infirm state of the system. In all instances where cold is applied in a degree capable of gradually reducing and finally arresting the vital actions, an indomitable *inclination to sleep* supervenes just before the fatal torpor comes on. When this oppressive somnolency ensues, all feelings of pain or suffering cease—and if it be not resisted, death is inevitable.

Heat.—High atmospheric temperature acts much more frequently as a predisposing than an exciting cause of disease. "Solar heat," says Dr. James Johnson, "produces only the predisposition, while terrestrial exhalations and cold call into action the principal diseases of hot climates. The mode in which solar heat contributes to the production of disease, appears to be either by augmenting the general irritability of the system, or more generally, by exciting inordinate functional action of the *skin* and the *liver*, and thereby rendering them more susceptible of the paralyzing impressions of cold. Between the skin and the liver there exists a close and powerful sympathy, in consequence of which, whatever excites the functions of the former, produces, perhaps, an equal increase of the functions of the latter organ."† Hence, high atmospheric heat very generally produces an increased secretion of bile, by its influence upon the liver through the medium of the skin, whose functions it is so peculiarly adapted to augment. It is manifest

* Dr. James Johnson, *passim.*

† James Johnson, *On the Influence of Tropical Climates, &c.*

that an inordinate activity of these two functions from the influence of *heat*, must render them extremely obnoxious to torpor or inactivity from the sudden application of *cold;* and it is equally obvious, that a sudden torpor of these two important emunctories cannot occur without an immediate injurious consequence upon the whole system. Solar heat is, moreover, extensively concerned as an *indirect* cause of febrile affections, by favoring the production of *marsh miasmata*. By its expansive and exciting influence, it sometimes gives rise to sudden and dangerous local determinations, particularly to the head, causing apoplexy, and that state of cerebral oppression called a stroke of the sun.

Sect. IV.—*Of Miasmata.*

The term *miasmata* is here used as designating a highly important class of febrific agents of a *gaseous* form, which act on the animal system through the medium of the atmosphere. This *class* of agents consists of two *orders*, namely:—1. *Infection*, comprehending those febrific effluvia which are generated by the decomposition of vegetable and animal matter; and—2. Aëriform contagions, generated by the animal system in a state of disease.

1. *Infection*, or that variety of febrific agents which is produced by decomposition out of the animal system, consists of two *genera*, namely:—1. Those which result from the humid decomposition of vegetable and animal substances contained in the public filth of cities, in marshes, and in other soils and situations furnishing these materials. This genus is usually designated by the term *marsh miasm;* but from the common or public source of these morbific effluvia, it has been proposed, and by some adopted, with much propriety, I conceive, to distinguish them by the compound term *koino-miasmata*. 2. Those febrific effluvia which are generated by the decomposition of the natural exhalations and excretions of the human body, accumulated and confined in crowded and ill-ventilated habitations. These deleterious effluvia, originating from the decomposition of matter derived from the human body, have, with equal propriety, been designated by the term *idio-miasmata*, expressive of the personal or private character of their source.* Before treating of these febrific agents, in an etiological point of view, it will be proper to describe, more circumstantially, the manner and circumstances in which they are generated, as well as their physical characters, so far as these can be known.

I. Koino-miasmata, usually designated by the terms *marsh-miasmata*, or *malaria*. This morbific agent was not unknown to the ancient Greek physicians. They personified it under the emblem of a many-headed monster, whose devastating influence was so severely exercised over the luxuriant fields of Argolis, that it was made one of the labors of the potent son of Alcmenus to rid the

* These distinctive terms were originally proposed and adopted by the late Dr. Edward Miller, of New York, in the year 1804. He observed that there were two species of miasmata; the one consisting of febrific exhalations from marshes and other soils, and the other of effluvia generated by the decomposition of personal and domestic filth. "In order to distinguish these two varieties of *miasmatic* agents, and, at the same time, duly to fix in the mind the impression of the origin and production of them, it is judged expedient to designate each by terms which will, invariably, express the process of nature in their formation. As the Greek language has been generally resorted to in the framing of scientific nomenclature, I shall employ the adjective ΚΟΙΝΟΣ, *common* or *public*, to denote one species of miasma, and ΙΔΙΟΣ, *personal* or *private*, to denote the other. The application of these terms will be readily understood. That portion of the air charged with miasmata exhaled by solar heat, from the surface of swampy ground, or from masses of filth overspreading the open area of cities, according to this distinction, is denominated *Atmosphera koino-miasmatica*. And that other small portion of air, contaminated by miasmata, emitted from, and surrounding the body, clothes, bedding, and furniture, of persons immersed in the filth of their own excretions, and of those associated in the same family with them, accumulated, long retained, and acted upon by animal heat, is denominated *Atmosphera idio miasmatica*." —*Attempt to deduce a Nomenclature, &c.* Med. Repository. New York, 1804.

country of this dreaded source of pestilence. Hercules, accordingly, drained the extensive Lernean marshes, and thus dried up this abundant source of pestiferous emanations.

Heat and *moisture* are indispensable to the generation of koino-miasmata; without these, no decomposition can take place, and without decomposition no deleterious agents can be generated from dead vegetable and animal substances. In latitudes where the atmospheric temperature seldom rises above 60°, the diseases which arise from this agent occur but very rarely, and, perhaps, never in an *epidemic* manner. The Lithuanian marshes of Russia do not render the surrounding districts insalubrious. It would seem, indeed, from a long series of observations, that *koino-miasmata* are seldom evolved to a degree sufficiently copious or active to create extensive disease, so long as the temperature of the air does not rise above 80° of Fahrenheit. It is, however, not necessary that *moisture* should be present in great *abundance* for the production of miasmata. Indeed, grounds completely covered with water, send forth but very little of this deleterious effluvium, however favorable the temperature and other circumstances may be. Hence, copious and continued rains, by inundating marshy soils, render such localities comparatively salubrious, (Dalzille, Ferguson.) Ferguson was led to infer, from his observations on this point, that miasmata were extricated wholly independently of the humid decay or decomposition of vegetable and animal matter, and apparently without the agency of humidity. He asserts that this aëriform poison is never extricated, in any considerable quantity, until the moisture of the soil is so far dissipated as to leave the ground in the last stage of the drying process. This, however, is decidedly contradicted by almost universal experience. In proof of his opinion, among other observations, he says: "In the months of June and July our army marched through the singularly dry, rocky, and elevated country on the confines of Portugal, the weather having been previously so hot, for several weeks, as to dry up the mountain streams. In some of the hilly ravines, that had lately been water-courses, several regiments took up their bivouac, *for the sake of being near the stagnant pools* of water that were still left among the rocks. Many men were seized with intermitting fever." From this, and similar facts, he thinks himself warranted to conclude, that the humid decay of vegetable and animal matter has no immediate agency in the production of miasmata, and that moisture, particularly, is not essential. But "half dried ravines and stagnant pools of water" are surely no evidence of a want of humidity, and present, one should think, precisely the conditions most favorable to the emission of miasmata from vegetable and animal decomposition.

It may be observed, that in every instance adduced by Dr. Ferguson, in proof that the extrication of miasmata does not depend on the *humid* decay of vegetable and animal matter, the soil from which the miasmata were emitted had been previously thoroughly saturated with water, during the rainy season, and moisture must, therefore, have existed in sufficient abundance, a short distance under the *surface* of the soil, however parched the latter may have been. Under such circumstances, miasmata might be abundantly sent forth, without any obvious humidity and vegetable decomposition, on the surface; for the vegetable and animal remains, collected during the rainy season, must have been gradually decomposed during the drying process, and left, in part, at least, mingled with the portions of the soil on the surface. In this state, then, the slow evaporation of the humidity under the surface, in passing up into the air, would dissolve the putrid but dry particles of animal and vegetable remains, and convey them in the form of an effluvium into the circumambient atmosphere.

That a considerable degree of humidity is especially favorable, and even essential, to the evolution of miasmata, is evident from the circumstance that marshes, stagnant pools, and the oozy shores of rivers, have, in all ages, and in all countries, been found the most insalubrious portions of the earth during the hot seasons.

As to the variety of *soil* most favorable to the production of miasmata, we

possess no very definite or certain information. It has been asserted, that an argillaceous soil is most favorable for the extrication of this effluvium; but its tendency in this way appears to depend solely on its greater compactness, in consequence of which, it retains humidity much longer than other soils, and thus favors the formation of marshes, and of standing pools of water.

It is not, however, from marshy or low and humid soils alone, that this morbific effluvium is disengaged; for "there is scarcely a spot of this earth's surface to be found that is not covered or imbued with both vegetable and animal remains in a state of decomposition, and ready to afford pabulum for the sun's rays, with or without humidity, to extricate *malaria.*"* Wherever vegetable matter meets with sufficient heat and moisture to cause it to enter into humid decomposition, there miasmata will be evolved, and in our own climate there are very few, if any situations, that do not at times furnish all these conditions to a greater or less extent.

A mixture of *fresh* and *salt* water in marshes, appears to enhance the copiousness and virulence of miasmata to a very obvious degree. It is a singular fact, that the water of the sea is much more apt to enter into putrefactive decomposition than fresh water; and this, no doubt depends on the great quantity of organic matter which it contains. M. Monfalcon mentions some interesting examples illustrative of this fact.† The extensive pool of Valdec, in the south of France, is quite saline. Not more than a few rods from it is a large pool of fresh water called *Engrenier*. When the waters of these two pools rise, and run into each other, as they occasionally do, much sickness soon occurs throughout the adjoining parts. In the vicinity of Lukes, on the south of the Ligurian Apennines, there is a large marshy plain accessible to the high tides of the ocean. The neighboring districts were almost uninhabitable from the pestilential effluvia which emanated from this marsh, until the waters of the sea were separated from the sweet water of the marsh by means of sluices and hydraulic works, when it became healthy, and the population increased rapidly.

Of the nature of *koino-miasmata*, we possess, as yet, no certain knowledge. Examined chemically, the air of the most pestiferous marshes is found to differ in nothing from the purest and most salubrious air. According to the experiments of Professor Julia, of Lyons, it would appear that

1. The deleterious influence of *koino-miasmata* depends on particles of putrid animal or vegetable matter dissolved and suspended in aqueous vapor.
2. The air of marshes does not differ from atmospheric air in any of the principles which chemical analysis can detect.
3. None of the gases disengaged from bodies in a state of putrefaction, exhibit themselves in a sensible quantity.
4. The disorders caused by *koino-miasmata* are not in any degree dependent on the predominance of azote, of carbureted hydrogen, of ammonia, of nitrous oxide, &c., in the air.

That koino-miasmata consist in particles of putrid vegetable and animal matter, dissolved in aqueous vapor, receives considerable support from the experiments of Gaspard and Magendie on the effects of putrid exhalations on animals, and which have already been cited in a former part of this volume. Magendie found, that on exposing different animals to the exhalations of putrid animal matter, affections were produced analogous to those which are known to occur in man from the influence of pestilential miasmata. It is not improbable, therefore, that such putrid materials, suspended in vapor, constitute the deleterious principle of miasmata of this kind; and it may be reasonably presumed, that the different modifications of disease produced by this agent, in different localities, depend in a great degree on the different degrees of concentration, as well as on the particular character and proportion of the substances from whose decomposition the putrid miasmal particles are derived. It can hardly be doubted that the relative

* Dr. James Johnson, Med. Chir. Rev.
† Histoire Médicale des Marais. Paris, 1828.

proportions of animal and vegetable matter which may enter into miasmal exhalations, will determine the violence of their influence, and modify its results on the system. Plausible as these sentiments may be, it should not be forgotten that they are founded on no *certain* data, and that we may, after all, as yet be remote from the truth in relation to this subject.

Whatever may be our views concerning the essential nature of koino-miasma, observation has made us acquainted with certain of its physical properties, as well as with its general effects on the human system, and which is perhaps all that it imports us, in a practical relation, especially to know.

Koino-miasmata possess a greater specific gravity than atmospheric air (De Lisle). They cannot, consequently, ascend into the air without being attached to and carried up by lighter bodies: and these vehicles consist, without doubt, of aqueous vapors. Hence, persons sleeping in elevated chambers, are much less apt to contract miasmal diseases than such as are lodged on the ground floor (Hunter on the Diseases of Jamaica, Blane, Lempriere,* De Lisle). And hence, too, the greater salubrity of hills, and very elevated parts, than the adjoining low grounds. The ancient Romans appear to have been fully aware of this fact, and they availed themselves of it by almost uniformly selecting very elevated positions, or hills, for the sites of their towns. It is true, that some very remarkable exceptions have occurred to this fact. Bancroft mentions the great mortality which has repeatedly been observed on the top of Montéfortuné, at St. Lucie: and on the Hospital and Richmond hills, at Grenada, while the surrounding low situations were comparatively salubrious. Dr. O'Hallaran, in his account of the yellow fever of the south and east coasts of Spain, mentions similar examples of the great prevalence of miasmal diseases on very elevated situations, whilst the surrounding marshy grounds were but little infested with this deleterious effluvium. He refers particularly to *Monjui*, a hill 700 feet high, overlooking Barcelona, the air of which, he says, is so deleterious, that it was found necessary to relieve the stationary guard every eight or ten days; and he adds that the injurious influence of the exhalations arising from the swamps below manifested itself more conspicuously upon the summit of the hill than in the subjacent parts. Dr. Blane, who mentions similar facts, explains them by supposing that the vapors formed on the low and swampy grounds ascend, and, with the miasmata which they hold in solution, pass over the lower situations, and impinge and settle on the neighboring hills. It is, indeed, by no means uncommon to see fogs, which rise out of the low grounds, ascend and hover over the tops of the neighboring mountains, and it may well be presumed that these fogs will convey along with them a large portion of the miasmata which may be extricated from the same grounds whence the aqueous vapors rise.

Koino-miasmata are abundantly precipitated to the surface of the earth during the night, and more especially during the first hours after the setting, and shortly before the rising of the sun. Hence, in part, the greater liability of contracting miasmatic diseases from exposure between the setting and the rising of the sun than after the sun is considerably above the horizon (De Lisle, Bancroft, Sir James Fellows, Johnson). The most dangerous point in the twenty-four hours of the day is "that which accompanies the setting and that which immediately precedes the rising of the sun, and the least critical time is when the sun is at its highest point above the horizon" (De Lisle). In these facts we have strong evidence of the correctness of an observation already made—namely, that the miasma is united with and suspended in the air by aqueous vapor, which, falling in the form of dew, carries down along with it the deleterious miasmatic particles.

Koino-miasma may be arrested in its progress or passage from its source to

* Drs. Blane and Lempriere, in their Report to the Secretary of War concerning the Walcheren fever, observe: "On no account should ground floors be used to sleep on: the more lofty the buildings the better, for the tenants of the upper stories not only enjoy the best health, but, when taken ill, have the disease in the mildest form."—*Bancroft on Marsh Exhalations.*

other parts, by whatever is capable of impeding and intercepting the progress of aqueous vapor. Thus the interposition of a dense forest, of a high wall or fence, of a chain of elevated hills, in short, of any mechanical obstacle of this kind, has been known to protect the inhabitants of villages, of camps, of convents, and of single habitations, from the pestiferous influence of neighboring marshes. De Lisle relates several very remarkable facts illustrative of this observation (Monfalcon, Bancroft). A convent situated on Mount Argental, near the village of St. Stephano, was, for a long time, remarkable for its salubrity, until the trees by which it was surrounded were cut down, when it became extremely sickly. From the same circumstance, miasmata are sometimes confined by obstacles of this kind, and so accumulated in particular localities, as to acquire a high degree of concentration and power. Marshes surrounded with dense forests, in warm climates, have often given unequivocal illustration of this fact. The same effect, in causing a stagnation and accumulation of miasmata, has been observed in most situations environed by high hills. In some of the valleys in the mountainous regions of South America, malaria are thus accumulated to a degree which gives them the utmost virulency, while the surrounding elevated parts are entirely free from miasmal diseases. This is remarkably the case of *Acapulco*, which, as Dr. Macculloch* observes, may be regarded as a striking instance "of the imprisonment of malaria by hills." It is in this way, too, says this writer, that we "may explain the peculiar virulence of jungles and pine swamps, and even of woods everywhere."

Considerable diversity of opinion has been expressed as to the distance to which miasmata may be diffused from their source in a state of sufficient concentration, to produce fever. In a quiescent state of the atmosphere, the sphere of activity is probably much more limited than has been generally supposed. Bancroft thinks that they are rarely carried beyond a quarter of a mile, even by unobstructed currents of air, in a state sufficiently active to produce fever; and he adduces several observations which seem to confirm this opinion. Unquestionably, however, currents of air passing over marshes often convey the miasmata which arise from them to a very considerable distance, sometimes several miles, in a state of concentration fully adequate to the production of their usual deleterious effects on the human system. "In Italy," says Dr. Macculloch, "the poisonous exhalations of the lake Agnano reach as far as the convent of Camaldoli, situated on a high hill, at the distance of three miles, proving that thus far, at least, malaria can be conveyed by the winds." The account of the thirty Roman noblemen, mentioned by Lancisci, is an interesting and striking illustration of this fact. They were sailing near the mouth of the Tiber on a party of pleasure. Suddenly the wind shifted, and blew over the putrid marshes. Twenty-nine out of the thirty were soon seized with intermitting fever. The effects, often truly frightful, of the *harmattan*, after becoming loaded with the pestilential effluvia of the swamps of Benin, afford also a strong illustration of this fact. From this circumstance it not unfrequently happens that those who reside on the leeward margin of marshes, or sluggish streams, are extremely harassed by miasmal diseases—while those who sojourn on the windward side remain almost entirely exempt from these affections. Dr. Macculloch relates an instance from his own observation which strikingly illustrates this fact. "An army was encamped in a very pestiferous plain, yet the health of the men did not suffer, because, being near the shore, the sea-breezes predominating at that season, swept back the malaria into the interior country. From some cause the encampment was transferred to another point, without recollecting that the change of the regular winds was approaching. They did commence, sweeping in a new direction across the plain, and, within a few days, many thousand men were disabled or destroyed."

During the autumns of 1820, '21, '23, and '24, there was scarcely a family be-

* An Essay on the Production and Propagation of Malaria, &c.

tween the eastern shore of the Schuylkill and the city of Philadelphia, that did not suffer from intermitting and remitting fevers; whilst among the inhabitants of the western shore, and of the high grounds a short distance back, there was, comparatively, but little sickness. The cause of this difference manifestly consisted in the course of the wind, which, during the periods here mentioned, as indeed is generally the case, blew almost continually from the west, northwest, or southwest, and thus swept the miasma, which was generated along the oozy borders of the Schuylkill, in an eastern direction.

Violent storms, and copious showers of rain, tend powerfully to free the atmosphere from *koino-miasmata*. The former violently disperses them, and the latter sweeps or washes them down to the surface of the earth. Nothing is more common than to find miasmatic epidemics to remit immediately after copious floods of rain or violent storms (Rush, Bancroft, Monfalcon).

A humid air is a much better vehicle for the transportation of miasmatic exhalations than a dry one. The particles of the miasmatic poison attach themselves to the humidity of the air, and are thereby carried along by currents of wind. It is to be remarked, however, that, although atmospheric humidity appears to favor the dissemination and action of miasmata, yet observation would seem to show that when these effluvia pass over a surface of water, they become absorbed, or in some way lost. This circumstance may, in part, account for the short distance assigned by Bancroft to the dissemination of miasmata from their source; for in all the examples which he adduces in support of this opinion, the miasmata were conveyed over bodies of water.

II. Idio-miasmata.—This variety of miasmata is generated by the decomposition of the matter of perspiration, and the other excretions of the animal body; and hence it most frequently occurs in the confined and crowded hovels of the poor, in crowded jails, ships, hospitals, and wherever many individuals are confined in apartments not duly ventilated. From an inability to procure separate dwellings, the poor are generally obliged to take up with small apartments, into which two or three families are often crowded; and in order to save fuel, and indeed frequently from the total want of fuel, every access of the external cold air is carefully cut off. Add to this the filth and want of proper changes of clothing, almost inseparable from extreme poverty, and you have a combination of circumstances peculiarly calculated to generate a miasma, by the putrefactive decomposition of the animal exhalations with which the air and every article of clothing in such apartments must be saturated. It is chiefly during the *cold season of winter* that this variety of miasmata is generated. When the weather is warm, the air of crowded and filthy apartments is constantly renewed by the doors and windows being kept open, and the accumulation and stagnation of the animal exhalations thereby prevented. Dr. Smith observes, that this miasm is especially apt to be generated in the apartments of the sick, particularly "of those who are laboring under the typhus state of fever."* It may be observed, however, that the exhalations which emanate from the body in a *state of disease*, and which possess the power of producing the same disease as that under whose influence they are evolved, cannot, with strict propriety, be ranked with the present class of miasmal poisons. They belong to the *contagions*. I would restrict the term *idio-miasma* to those morbific *effluvia* which are generated by the *decomposition* of the animal secretions, whether formed in a state of health or disease, and to the ordinary exhalations from the body, when accumulated in such a manner as to deteriorate the atmosphere of confined rooms, if these be really capable in themselves, and without decomposition, of exciting fevers.

Idio-miasmata are always quite limited in the sphere of their influence. Beyond the room or habitation in which they are generated their operation cannot extend; unless, indeed, they are absorbed or adhere to articles of clothing, and are conveyed abroad in a state of sufficient activity to act on the human

* Elements of the Etiology and Philosophy of Epidemics, p. 52.

system. Whenever fever is found to spread from a source of idio-miasmata, it is in consequence, doubtless, of the generation of a new contagious miasm by the disease, which is produced in the first instance by the idio-miasmatic poison. I am well aware that this opinion involves what has been declared a manifest inconsistency—namely, the origination of a *contagious* disease by a *common* or general exciting cause. All such objections, founded merely on speculative inferences, may be met by *facts*, which *must stand good*, however irreconcilable they may appear to be with the dogmas of philosophy, or with admitted principles. It is a *fact*, for instance, that typhus may be originated by the miasm resulting from the decomposition of the secretions or exhalations of even healthy individuals, crowded and confined a long time in narrow and unventilated apartments. And that, although not necessarily a contagious malady, typhus may, under peculiar circumstances, generate a specific virus which is capable of exciting the same disease in others, is a fact supported by a mass of testimony which cannot be reasonably rejected. "There are a few physicians," says one of the most eminent medical writers of the present day,* "who believe that epidemic or endemic fevers *arise* from specific contagion, though facts daily teach us that typhus, yellow fever, dysentery, &c., occasionally, and under particular circumstances, *give out* a something (call it what you please), which produces a similar disease in the healthy stander-by, who happens to come within its range. If we may venture to prognosticate, we would anticipate that this *will be*, as it assuredly *now is*, the more general opinion among *practitioners*."

From the circumstance of this variety of miasmatic poison "becoming innoxious when diffused in the atmosphere, even a few feet beyond the apartments in which it is generated," none of the forms of disease, which it is capable of producing, are apt to occur epidemically. Typhus, nevertheless, has been known to occur in a manner well entitled to the name of epidemic. The late widely-spread epidemic of Ireland was surely strongly characterized in its progress and extent of diffusion by every feature which can give to diseases the character of an *epidemic*. Though engendered and nursed in the lap of wretchedness and poverty, it did not, in its desolating sway, fall exclusively upon those who were suffering under the distressing privations of penury. Its fatal visitations were abundantly made to the ample and airy habitations of plenty and comfort, and almost—

> ——æquo pulsat pede pauperum tabernas
> Regumque turres.

The question here occurs: "If idio-miasma becomes innoxious by being diffused in the atmosphere even a few feet beyond the apartments in which it is engendered," how can typhus, which is manifestly originated by this effluvium, become epidemic, or be produced in large and well-ventilated dwellings remote from the usual sources of this miasm? Is it by the idio-miasma attaching itself to the clothes of individuals, or to other substances by which it may be conveyed from one to another place? If this be admitted, then *idio-miasma* must possess the character of a contagion. Is it not more probable, that in the majority of instances of this kind, the disease is propagated by a specific virus, generated by a morbid secretion, and conveyed as other contagions of an aëriform character are conveyed? It does not seem probable that idio-miasmata can be disseminated by fomites. If it can be so disseminated, it must possess all the characteristics of a veritable contagion.

Of the relations of Miasmata to the Animal System, &c.

Having given an account of the physical character and conditions under which the two infectious effluvia, *koino* and *idio-miasmata*, are evolved, I proceed to the consideration of their relations, as morbific agents, with the human system, as well as with each other. Upon this subject I stand largely indebted to the

* Dr. James Johnson, Med. Chir. Rev., vol. vii. (1825), p. 65.

ingenious and truly philosophical work of Professor Smith, of New York; for, although I have long since entertained similar views in relation to the combined agency of these miasmal poisons in the production of fevers, yet the enlarged, systematic, and precise views taken of this subject by Dr. Smith, have afforded me some new and interesting insights into this part of the etiology of fevers.

The class of fevers arising from koino-miasmata are very distinct in their general character, and we may presume, in their essential natures, from those which are the result of *idio-miasmata*. The former give rise to intermittent, remittent and bilious fevers; and the latter miasm is the source of *typhus*, and the *low nervous fevers* of former writers.

The deleterious power of *koino-miasmata* is manifested not only by the violent and fatal fevers which they are known to produce so abundantly, but also by the more slow inroads they make on the physical and moral condition of those unfortunate beings who are habitually exposed to their influence. The indigenous inhabitants of marshy districts, in warm climates, present an aspect of suffering and wretchedness from this cause which is well calculated to draw forth the commiseration of those who are more fortunately located. Continually exposed to the deleterious influence of these baneful exhalations, man, in such situations, exhibits a state of feebleness and early decrepitude, strongly indicative of a broken-down constitution, and deep, irremediable chronic disease. So deep and pervading, indeed, are the effects of malaria on the human system, that it never fails to debase, in a remarkable manner, both the physical and moral constitution of a people, who, through successive generations, reside in situations abundant in perennial sources of miasmata. Not only do the stature and symmetry of the body suffer conspicuous deterioration, but the mind becomes torpid, feeble, pusillanimous, and the moral sentiments debased.

But while such chronic and constitutional effects are wrought by the habitual endurance of *koino-miasma*, the system loses its susceptibility of being excited into those violent commotions of febrile action which this agent is so apt to produce in individuals less accustomed to its impressions. The natives of marshy districts are comparatively much more rarely affected with the higher grades of miasmal fevers than those who are only occasionally brought within the sphere of its influence. In the former, the agency of this poison proceeds as it were by a slow and concealed combustion, whilst in those who are not accustomed to its influence, its effects burst out in a raging and rapidly consuming flame.

There can be but little doubt that *koino-miasma* varies in its powers, and often very considerably, according to various circumstances in point of locality, and the relative proportions of the animal and vegetable matter which supply the materials for its composition. Dr. James Johnson, whose authority I am always disposed to respect, has expressed his belief in the occurrence of such diversities in the peculiar morbific powers of this agent. "The fever of Batavia," he observes, "differs from the fever of Walcheren—the fever of Antigua, from the fevers of the Ganges—and all these differ materially from the plague of the Levant." That certain countries and localities have an especial tendency "to generate one mode or variety of fever, while, in other situations, some other variety as exclusively prevails," is an observation founded on abundant testimony of unquestionable authority. In Germany, intermittents almost universally assume the tertian type; in Italy, the quotidian type greatly predominates; and in Hungary, paludal fevers are peculiarly apt to be attended with petechiæ. "The fevers of the Pontine marshes are noted for the shortness of their intermissions; whilst Holland is not less remarkable for the variety of the types than the slow progress of the fevers. In Spain, as in Africa, the West Indies, and the southern parts of the United States, the black vomit and the yellowness of the skin are similarly characteristic symptoms."* Even in localities situated within a short distance from each other, the most remarkable difference occurs in the character

* An Essay on Malaria, &c, by John Macculloch, M. D.

of the fevers which they engender. Thus, "the fevers of Walcheren," says Dr. Macculloch, "differ materially from those of Bresken on the opposite shore of the Scheldt; and in France those of Rochefort differ as completely from those of the Lyonnais."

It cannot be presumed that the relative proportions of animal and vegetable matter should be the same in different localities, and equally improbable is it that the same *kinds* of these materials should be present in the different situations where miasmata are generated. There must be great diversity in both these respects, and a corresponding diversity in the essential morbific qualities of the miasmata evolved from them. I have already mentioned the experiments of Magendie in relation to the effects of putrid animal substances on the animal system. From these, it appears, that "different *kinds* of flesh, when in a putrid state, produce different effects on the animal economy,"* and it is, therefore, reasonable to conclude that miasmata will differ in their powers according to the greater or less *proportion* and *kinds* of the animal and vegetable matters concerned in their production.

The influence of *koino-miasmata* on the human system, like that of other general causes of disease, is much under the control of the physiological state of the animal economy, of idiosyncrasy, of temperament, predisposition, and of accidental external causes. Thus of a number of individuals exposed for a certain time to the same *miasm*, some may become affected with intermittent fever, others with mild remittent fever, some with malignant bilious fever, some with bilious colic, some with dysentery, and others, perhaps, will escape the disease entirely.

The influence of high atmospheric temperature in predisposing the system to the deleterious impressions of miasmata is, probably, very considerable. Long continued exposure to solar heat appears to have an especial tendency to affect the biliary organs, and to render the system generally irritable. These conditions, it may be presumed, are peculiarly favorable to the morbific influence of malaria; and it is not improbable that they sometimes contribute, in a considerable degree, to render the miasmatic fevers of intertropical or hot climates so peculiarly violent and dangerous. Dr. Macculloch dwells much on "errors of diet" as a predisposing cause of the miasmal fevers. It would appear, that the free use of animal food, in tropical climates, is peculiarly calculated to favor the morbific influence of miasmata; and this is said to be especially the case when the animal food is taken "in the middle of the day, or frequently in one day." On examining Niebuhr's narrative, says Dr. Macculloch, "it is most apparent that the deaths of his companions were the consequences of gross feeding." "On this question," says the same writer, "there can perhaps be no better evidence than the opinions and practices of the intertropical nations themselves, among the mass of whom this subject seems well understood; while in many countries it is a caution actually often given to Europeans by the natives, though most generally neglected by them. It is, probably, from long experience, in some measure, of its advantages, as well as from more obvious causes, that a vegetable diet is so general throughout the aborigines of the torrid climates, while it is doubtless from principle, also, that among the people of Africa, to the northward, at least, the sole or the principal meal is supper."

The class of diseases produced by koino-miasmata, if we take into view their various modifications, is by no means limited in its range. The most simple form of disease arising from this cause is the intermittent fever. In proportion as this febrific effluvium increases in potency, so does it produce fevers of a higher and more violent grade. The range of activity of this miasma extends from the simple tertian of the temperate latitudes to the malignant and fatal plague of the East, or the scarcely less fatal bilious fever of Batavia.

Besides general fevers—assuming an endless diversity of character in different

* Journal de Physiologie, Janvier, 1823.

seasons and climates, koino-miasmata produce, also, various other affections, both local and general. Dysentery, cholera, and diarrhœa, are enumerated among the maladies produced by malaria. It may be doubted, however, whether miasma, by itself, without the co-operation of other causes, has any particular tendency to excite those affections. I apprehend, that in many instances occurring in malarious districts, as elsewhere, atmospheric vicissitudes, or cold, exerts no small degree of influence in determining the disease upon the alimentary canal. During the autumn of 1814, one-fourth, perhaps, of the men of four regiments encamped near Baltimore, were affected with intermitting and remitting fever in the month of September. The weather was remarkably warm, equable and dry. The months of October and November, however, were rainy, extremely variable in temperature, and the majority of the men, who were previously lodged in covered rope-walks and houses, were now encamped in tents. A week after the rainy and cold weather set in, dysentery and diarrhœa began to appear abundantly, and in the course of three weeks more, there were but very few cases of intermitting or remitting fever, but more than eight hundred cases of dysentery. Nevertheless, the capability of miasmata of producing these forms of intestinal disease by its own unaided powers, is not to be questioned, although it is, I think, equally evident, that the co-operation of sudden changes of atmospheric temperature, or cold, is especially calculated to enhance the tendency of the miasmata to occasion these diseases. From these remarks, cholera ought to be excepted, for the cholera of India, at least, is most undoubtedly the product of a miasmatic agent.

Dr. Macculloch mentions tic douloureux as a common consequence of the influence of miasmata—more especially in Italy; and the occurrence of periodical hemicrania, from this cause, is by no means unfrequent even in our own climates. In truth, there is scarcely a malady that may not be produced or simulated by the operation of malaria on the human system.

The period which intervenes between the reception of koino-miasma and the first manifestation of its influence on the human body, is extremely various. Of many persons exposed to it at the same time, some may be immediately affected, others in a few days, some not until several weeks have passed, whilst others may remain free from its effects a still longer time.

As the powers of *koino-miasmata* most probably vary considerably in different countries and localities, it may be inferred, as has already been observed, that the fevers which they produce are impressed with a corresponding diversity in their character; and observation would seem to confirm this inference. Dr. Smith thinks, that whatever external or general diversities may occur in fevers produced by this miasma, "their pathology or essential nature is everywhere the same." This is highly probable; for the diversities in question would seem to depend more on the mere grade of violence, local affections, and general course of these fevers, than on any radical difference in their essential pathological conditions. Upon this point, however, it becomes us to speak with diffidence, as this question cannot be solved by mere closet inferences and reasonings, but by close observation and careful experience, in relation to these fevers as they occur in various countries, climates, and localities.

How far a mixture, or the combined agency of *koino* and *idio-miasmata*, may operate in producing novel or anomalous varieties of fever, it is impossible to say; but that such a combination does sometimes occur, and give rise to fevers of a peculiar or mixed character, will scarcely be doubted by any one who has given due attention to this interesting subject. Professor Smith, to whose work I have already so frequently referred, has given this subject a comprehensive and minute consideration, and to whom, indeed, the credit is due for introducing this interesting point of etiology to the notice of the profession. "Let us suppose," says Dr. Smith, "the circumstances in which typhus originates, to occur in summer, such as the crowding of individuals into small apartments, badly ventilated, and rendered offensive by personal and domestic filth. These causes would

obviously produce typhus in its ordinary form. But suppose there exist, at the same time, those exhalations which occasion plague and yellow fever, or intermittent and remittent fevers. Under such circumstances, we should not expect to see any one of those diseases fully and distinctly formed, but a disease of a novel or modified character." There exists no doubt in my mind of the correctness of Dr. Smith's observation, that the late Bancker Street fever in New York, as well as the peculiar fever which prevailed among the blacks in this city, a few years ago, was engendered by the united influence of these two miasmal poisons. I once had a striking illustration of the anomalous and fatal character which the united action of *koino* and *idio-miasmata* is apt to impart to fever. During the fall of 1814, while attending in the capacity of regimental surgeon, in the encampment at Baltimore, ten men affected with mild remitting fever were lodged in a room of confined dimensions, and as the weather was cold, the room was kept pretty warm by fire, and the doors and windows as little opened as was admissible. The adjoining room was exceedingly crowded with invalids, and but little attention paid to cleanliness and ventilation. In a short time several cases of fatal typhus occurred in this room. Soon after this, the patients who were affected with intermitting fever in the next room, manifested new and more alarming symptoms; blood began to ooze from their gums; extreme tenderness of the epigastrium occurred; the intellect was but little disturbed; the eyes were dull, watery, and staring; the temperature of the skin and the pulse nearly natural; the animal powers so little prostrated, that one of the men died a few minutes after he had been sitting up with his back leaned against the wall of the room. They were all immediately removed to the Baltimore Hospital, and all except one died in a few days. There can be no doubt that this peculiar modification of febrile disease was the result of the impressions of *idio-miasmata* (engendered in the house), made on systems already under the morbific influence of *koino-miasmata*.*

* A considerable effort has of late been made to destroy the doctrine of miasma. Dr. Willis, in his treatise on the Pathology of Fever, totally denies the existence of miasma, and inscribes all its imaginary influences to *moist warm air*. He advances many arguments in favor of this idea, and quotes the observation of Fourcault, that a healthy animal will soon die if its body be covered with an impervious glaze. "Becquerel and Breschet, repeating the experiment of Fourcault, discovered that the extinction of life under such circumstances was accompanied by a signal fall of temperature; the animal whose body was endued with an impervious glaze, began to lose heat on the instant, and the loss never ceased till life had fled." The function of the skin is intimately connected with vital manifestations—and Dr. Willis conceives that this explains why such serious consequences should follow its derangements. "In a hot dry atmosphere animals perish from the effects of excitement; in a warm, moist air of a temperature no higher than that of their own bodies, they die as they do when covered with an impervious glaze—the conditions requisite to the access of oxidized plasma, and the removal of deoxidized plasma are wanting, and life ceases as a matter of course."

The reviewers, who show the greatest deference to the views of Dr. Willis, attribute much importance to the fact that the dew point in warm and moist situations is very little below the temperature of the atmosphere; and also to the new observation of Fourcault, that albuminous urine is produced by covering an animal with glaze. Notwithstanding the ingenuity of these ideas, and the importance of these facts, it will be found very difficult to overcome the weight of evidence brought forward in the preceding chapter to prove the existence of miasma from the influence of winds, situation, atmospheric vicissitudes, &c.

This theory of Dr. Willis is, moreover, very deficient in the way of accounting for the varieties of such fevers as are usually attributed to the different forms of marsh effluvia. How can a single cause like "warm and moist air," produce a quotidian in one place, a tertian in another, a bilious remittent in others—with all the various epidemic and endemic complications of them that are so constantly remarked by authors and practitioners? How can a mere exposure to such a condition of the air produce a predisposition to fever which is frequently not developed until the lapse of many weeks? There is no validity in the argument that miasm does not exist, because we cannot analyze it by chemical reagents. We do not doubt the existence of the contagious cause of small pox, although no chemistry can appreciate it.—(Mc.)

Sect. V.—*Of Contagion.*

By a contagion is understood a deleterious agent secreted by the animal body in a state of disease, which, when brought to act on a healthy individual, will produce a disease specifically similar to the one from which it derives its origin. Contagions occur under two distinct forms, and may, therefore, be divided into two varieties: viz., 1. Those which consist of a *palpable matter* or *virus;* and, 2. Those which consist of an *imperceptible effluvium.* The *chronic* contagious maladies are propagated exclusively by a *palpable* virus, and consequently always by actual contact. Those *acute* contagious diseases which are not attended by a specific local affection, or an exantheme, are, on the other hand, exclusively propagated by a morbific contagious *effluvium*, and by consequence, solely through the medium of the atmosphere. Those *acute* diseases, which *are* essentially connected with a *specific local affection*, or an *exantheme*, are communicated both by a palpable virus, and by an imperceptible effluvium, and consequently both by actual contact and through the medium of the atmosphere. We perceive, therefore, that of the extremes of a purely *local*, and a purely *general* malady, there is, on the one hand, communication of the disease solely by a *palpable* matter, and, on the other, by *effluvia* only; and that where the *local* and the *general* affections meet in the same disease, as essential concomitants, (in the exanthemata,) there the two modes of propagation also obtain.*

It must be observed, however, that though in a practical point of view we may properly adopt these distinctions between contagions communicated by *contact* and through the *medium of the atmosphere*, yet, in reality, an actual contact must, necessarily, always occur between the contagion and the individual, before it can possibly produce disease, whether the contagion be a palpable matter, or an imperceptible miasm. The only material difference consists in the mode in which this contact is effected.

One of the most remarkable peculiarities of contagious diseases, is their inherent and undeviating tendency to preserve their essential individuality, under whatever circumstances of age, sex, constitution, temperament, modes of living, climate, and place, they may occur. Thus, the small-pox of the present day differs in no essential circumstance from the same disease as it was observed and described by Rhazes more than eight centuries ago; and the itch has changed in nothing since the time of Galen. Any certain contagion can, so far as we know, produce only one disease; and if the system has become insusceptible of such disease, its peculiar cause is no longer a morbific agent in relation to that system.

The laws of the acute contagious diseases differ entirely from those which govern the rise, progress and declension of the chronic contagious affections. The former observe the utmost regularity in all these respects. The rise, advancement and decline, in short, the whole series of essential phenomena, are governed by laws as steadfast as those which regulate the motions of the planets. The latter class of diseases, on the contrary, are extremely irregular in their course, having no definite period of duration, nor established order and duration of the successive phenomena of their course.

The power which the acute contagious diseases have of destroying the susceptibility of the human system to the subsequent influence of their specific causes, constitutes one of the most remarkable and mysterious characteristics of this class of maladies. In this respect, they differ as far from the *chronic* affections of this kind, as they do from the febrile diseases produced by general or

* This arrangement is adopted from Dr. Hosack's very lucid classification of contagions and their peculiar diseases. There is no writer of the present day whose views upon the character and arrangement of this class of maladies deserve higher respect and attention than those which have been promulgated by Dr. Hosack.

non-contagious causes. In consequence of this law of *acute* contagious diseases, no malady of this kind can ever relapse during the period of convalescence.

Considerable diversity of sentiment has been expressed in relation to the distance to which contagious miasmata may be dispersed from their source, in a state of sufficient activity to generate disease. That their sphere of activity is very limited, however, has been abundantly demonstrated both by direct experiment and observation. The experiments of Dr. O. Ryan, professor of physic in the college of Lyons, prove that the contagious miasm of small-pox does not extend more than a few feet beyond its source.* The most malignant contagions are rendered inert and harmless by being diffused in the atmosphere, and even by diffusion in the air of a well-ventilated apartment. Ventilation diminishes the activity of contagious effluvia simply by diffusing the miasm in a large portion of atmospheric air, in consequence of which those who become exposed to it, receive it in weak and inefficient doses.

Contagions are perpetuated and conveyed to great distances from their source, by being absorbed by, and attached to, various substances, such as clothing, furniture, bedding, &c., with which they are often transported even across the ocean. Animal substances, such as wool, hair, and articles manufactured from them are said to retain contagious matter with the greatest tenacity. The more the substances which have become saturated with contagion are kept from the access of the open air, the more virulent and active will be its powers when it is brought to act upon the human system. Thus articles of clothing, after having been impregnated with contagious virus, will retain the power of infecting much longer, and in much greater intensity, if they are kept confined in close rooms, or locked up in chests or closets, than when they are freely exposed to the open air. It is by articles of this kind, locked up in trunks, that the small-pox, and other contagious maladies, have been conveyed to distant parts of the world in ships, although no person on board may have been sick with the disease during the voyage. The articles which are thus imbued with contagious virus, are called *fomites*. It was the opinion of Cullen, that contagions are more powerful when they are thus lodged in fomites, than when they arise immediately from the human body, or when in a separate state. The same opinion is expressed by Dr. Lind.

The influence which peculiar atmospheric constitutions have on the activity of contagions, and on their tendency to dissemination, is a subject as interesting as it is inscrutable. The most careless observation is sufficient to convince any one, that there exists in the varying constitutional, or perhaps accidental conditions of the atmosphere, a powerful modifying principle in relation to the powers of contagious agents. At times, it would seem impossible for a contagious disease to extend the sphere of its ravages; for, although sporadic cases may occur here and there, yet no neglect in relation to proper seclusion will enable the disease to assume an epidemic or endemic character. During other periods, on the contrary, the accidental importation of *fomites*, or the occurrence of a case of contagious disease, acts like a spark of fire thrown among combustible materials, and speedily spreads disease extensively among the people. The same powerful atmospheric influence shows itself in the diversity of character, in relation to the grade of violence, malignity, and general diathesis, which the same malady is observed to assume at different periods of its prevalence. That these things depend on some modifying agency of the atmosphere, there can exist but little doubt. What this condition of the atmosphere consists in, it seems impossible to ascertain; it is probable, however, that it has no immediate connection with either the temperature or the hygrometrical state of the air; for with the exception of typhus, which is manifestly favored by cold weather, the contagious diseases of every kind prevail equally during the heat of the summer and the cold of the winter. The mode in which contagions are either favored or re-

* Rees's Cyclopædia; art. Contagion.

tarded in their progress, by atmospheric constitutions, consists, probably, not in any influence which they may exert immediately on the powers of the contagion, but rather, perhaps, in their tendency to modify the human constitution, so as at one time to render it peculiarly susceptible of the influence of the contagion, and at another to diminish, or for a time to annul, the natural predisposition to its operation.

Of the primary source of contagion we know but very little. It is probable, that each contagious disease was at first developed, independent of contagion, by the accidental concurrence of various circumstances, which, in the infinite series of such contingencies, may not again occur for many centuries. That a disease may be originated by the concurrence of general causes, without the agency of a contagion, and which may afterwards communicate itself to others, by a specific virus of its own elaboration, we have a familiar example both in typhus fever and in itch. There is reason to believe, indeed, that various contagions have been thus produced, which have long since passed away from the face of the earth ;* and it is not an idle conjecture to say, that new contagions may hereafter arise, which, after having exhausted their power on mankind, may again disappear forever, or until a similar concurrence of causes, which at first evolved the contagion, again occurs.

It is an interesting fact, that contagious diseases sometimes originate in the lower orders of animals, and are afterwards communicated to the human species. Hydrophobia and the vaccine disease are familiar examples of this kind. Professor Remur has published some observations which go to show that other diseases, such as the virulent coryza of horses, the plica of long-haired animals, and the gangrenous inflammation of the spleen, which occurs in cows, may be communicated by immediate contact to man.

The following rules have been recommended for preventing the spread of contagious maladies to those who are obliged to approach patients laboring under diseases of this kind (Haygarth).

1. " The chamber in which the patient lies must be kept *clean and freely ventilated.* No bed curtains must be allowed to be drawn around the patient."
2. " Dirty clothes, utensils, &c., should be often changed, and immediately immersed in cold water; and washed clean when taken out."
3. " The discharges from the patient must be instantly removed ; and the floor around the patient should be rubbed clean once a day with a wet cloth."
4. " Avoid the current of the patient's breath, as well as the effluvia which ascend from his body, and from the evacuations."
5. " Visitors ought not to go into the patient's chamber with an empty stomach ; and, in doubtful circumstances, on coming out they should blow from the nose and spit from the mouth any contagious poison which may adhere to these passages."

Although it is quite certain that contagions will adhere to and imbue various substances, especially clothing, so as afterwards to reproduce the same disease, at a distance from their source, and often a long time after they had been generated ; yet it seems to be well ascertained, that such substances (clothing) can rarely be so greatly imbued with contagion by a slight and transient exposure to the poison, as to be capable, afterwards, of producing disease in the healthy. The clothes of transient visitors, for instance, will scarcely ever imbibe sufficient contagion to communicate the disease to others. Dr. Clark affirms, " that in eighteen years of medical practice, he never communicated the contagion of

* The *sudor Anglicanus*, so accurately described by *Caius*, appears to have been a highly contagious disease. It visited England five times in the period of seven years, and swept off a vast number of victims by its fatal violence. In many instances, those who were affected with it died within an hour, and few who sank under its malignity suffered longer than four or five hours. It has not been known to occur for several centuries past, its contagion having long since become wholly extinct.

small-pox or of scarlet fever to any one, although he had frequently, on the same day, visited many patients sick with these diseases, and in their most malignant forms."

Mere ventilation is inadequate to destroy the contagion deposited in fomites. To effect this important object, a great variety of means, such as exposing them to various vapors and fumes, have been devised. Without enumerating the different disinfecting agents which have been successively brought forward and again rejected, it will be sufficient to mention those which experience has shown to possess active powers in this respect, and which are now relied on as unquestionable disinfecting agents. *The nitrous acid vapors* have been much employed for disinfecting ships and houses in which contagion has been found to exist. Such was the evidence brought forward of the efficacy of the nitrous acid fumes in purifying infected places and fomites, that the British Parliament voted a national donation of five thousand pounds to Dr. Carmichael Smith for the discovery. This vapor is readily obtained by mixing with powdered nitre, in a cup, a little of sulphuric acid, and applying gentle heat with a lamp.

At present, however, chlorine, and the chlorides of lime and soda, are regarded as decidedly the best disinfecting agents we possess. M. Labarraque's *disinfecting soda liquid* is a compound of soda and chlorine, and its efficacy in destroying infectious matter has been conclusively demonstrated. "It is now much used in removing the offensive odor arising from drains, sewers, or all kinds of animal matter in a state of putrefaction. Bodies disinterred for the purpose of judicial inquiry, or parts of the body advanced in putrefaction, may by its means be rendered fit for examination; and it is employed in surgical practice for destroying the fetor of malignant ulcers. Clothes worn by persons during pestilential diseases, are disinfected by being washed with this compound. It is also used in fumigating the chambers of the sick, for the disengagement of the chlorine is so gradual, that it does not prove injurious or annoying to the patient. In all these instances chlorine appears actually to decompose the noxious exhalations by uniting with the elements of which they consist, and especially with hydrogen."

"Pure chloride of soda is easily prepared by transmitting to saturation a current of chlorine gas into a cold and rather dilute solution of caustic soda. In preparing the disinfecting liquid of Labarraque, it is necessary to be exact in the proportion of the ingredients employed. The quantity used by Mr. Faraday, founded on the directions of Labarraque, are as follows: Dissolve 2800 grains of crystalized carbonate of soda in 1·28 pint of water, and through the solution contained in a Wolf's apparatus, transmit the chlorine evolved from a mixture of 967 grains of sea-salt and 750 grains of peroxide of manganese when acted on by 967 grains of sulphuric acid diluted with 750 grains of water."*

CHAPTER III.

OF THE GENERAL COURSE, TYPE, AND STAGES OF FEVER.

The series of phenomena which intervene between the commencement of a fever, and its termination in convalescence, constitutes what is technically called its *course*. The course of a fever is either *intermitting*, *remitting*, or *continued*, according as its phenomena intermit, or remit, or are continuous.

The series of phenomena which constitute the course of a fever, may be di-

* Turner's Elements of Chemistry.

vided into *six* periods or stages: viz., the *forming*, the *cold*, the *hot*, the *critical*, the *declining*, and the *convalescing* periods.

It should be observed, however, that these stages are not always distinctly marked, in violent and continuous forms of fever, although very few fevers occur in which the primary stage of oppression, the stage of excitement, and the period of declension, may not be distinctly observed. The febrile paroxysm of an intermitting fever offers the most distinct exemplification of the successive changes or stages which occur in the course of a fever.

1. The *forming* stage—the *stadium prodromorum* includes the period which intervenes between the first impressions of the febrific cause, and the actual commencement of the febrile phenomena. This period is characterized by a variety of feelings or sensations, which, though manifesting a deviation from the healthy condition of the system, do not constitute any definite state of disease. These constitute the *premonitory* symptoms. Their duration is very various; and in some instances, though very rarely, they are entirely absent—the disease making its attack at once, without any previous manifestations of its approach. This is most apt to occur in fevers of very vigorous reaction, and in such as are of a malignant character. The longer or shorter duration of the premonitory stage depends, however, probably as much on the different powers of vital resistance as on the difference in the degree of concentration or activity of the remote febrific cause. The whole train of premonitory symptoms may be regarded as the result of the struggle between the vital powers and the febrific cause. If the cause be feeble, and the vital resistance great, its first impressions may give rise to some unusual or unpleasant sensations, until the system finally triumphs over its influence, and disease be obviated. When the relative powers of the cause and the vital resistance are more nearly balanced, the struggle between them may be prolonged, until the latter yield and disease be developed; and where the system resists feebly, whilst the febrific cause acts with energy, the contest will probably be short, and the fever occur suddenly, with violent symptoms. There exists, nevertheless, in almost every febrific cause, a natural tendency to produce some peculiar premonitory symptoms, although the general and most conspicuous of these phenomena are pretty nearly the same in almost every form of febrile disease. In general, those fevers which are apt to run through a protracted course, have a much longer train of premonitory symptoms than such as are violent and of short duration. Thus, the premonitory period is almost uniformly much more protracted in typhus and typhoid than in the synochal fevers.

The following are among the most common symptoms of this initial period of febrile affections: loss of appetite; disturbed sleep; yawning, stretching, lassitude; wandering pains in the limbs and back; an unpleasant sensation in the stomach; a harsh and dry skin; irregularity of the bowels; a general feeling of *malaise;* nausea; eructations; interruptions of the ordinary habits and appetites; fretfulness; discontent; slight headache; slight creeping sensations of cold; the drying up of old sores; tremors of the extremities; changed expression of the countenance; giddiness; and perhaps some other slight deviations from a state of perfect health, or the ordinary habits and feelings of the individual.

If we examine the symptoms of this stage in the usual order in which they occur, we will perceive that the nervous system is the first that suffers; this is manifested by the lassitude, languor and slight transient pains, which usher in this stage. Next, the digestive organs are brought into a state of slight suffering; and finally the skin. The heart and arteries appear to be the last organs which are brought into morbid action in the development of fever.

2. The *cold stage.*—Nearly all fevers commence with more or less sensation of chilliness. The feeling of cold is not always attended with an actual subduction of sensible temperature. In some instances the skin of the patient feels warm to the touch, whilst he is shivering under the severest sensations of cold. It is manifest, therefore, that in such cases, the feeling of cold depends in reality on an altered or morbid condition of the sensibility of the skin, in consequence

of which its power of *perceiving* (if I may use the expression) the ordinary degree of animal temperature is diminished. In most instances of febrile chills, however, there occurs an actual reduction of the temperature of the surface, especially of the hands and feet. Not unfrequently these parts feel quite cold to the touch of a healthy person, whilst the surface of the trunk and the forehead are of the natural temperature, and sometimes apparently even higher; although the sensation of chilliness experienced by the patient will be diffused throughout his whole system. The chills are attended with a pale, contracted, and dry state of the surface; the volume of the body is diminished; the respiration confined, irregular, anxious, and oppressed, attended frequently with a short dry cough; the head feels confused; the tongue is dry, attended sometimes with great thirst; the pulse extremely small, frequent, and feeble; nausea often occurs, and sometimes vomiting. The sense of chilliness is usually diffused over the whole body; though in some instances, it is partial, and occasionally, limited to a small part of the body. In general, the more violent the chills are, the more vigorous will be the subsequent arterial reaction. As the cold stage gradually subsides, the arterial reaction regularly rises, until chilliness has wholly gone off, and the disease has entered into the

3. Third, or *hot stage*.—This stage is characterized by what may be termed the essential phenomena of fever: viz., augmented heat, and a return of the natural fullness and color of the surface; flushed countenance; a full, quick, frequent and vigorous, or a small, tense, quick and frequent pulse; throbbing pain in the head; eyes prominent and sensible to the light; a dry and hot skin; urine scanty and high-colored; continued wakefulness, &c. These symptoms, with more or less intensity, continue for a longer or shorter period, until the *acme* of the febrile condition has arrived at the period when

4. *Crisis supervenes*. By crisis is understood, in the most general acceptation of the term, that period in the course of a fever at which it has arrived at its highest point, and a determination either to a fatal or favorable issue takes place; and by which, therefore, the fate of the patient is determined. The period during which this decision occurs, is necessarily always short; and is almost universally attended with some *evacuation*. The most common critical evacuation of a simple febrile paroxysm consists of a very greatly increased flow of *perspiration*, and hence the subsequent period during which this evacuation is continued, is called the *sweating stage*, but which I would call

5. *The stage of declension—stadium decrementi morbi*.—This stage may be considered as commencing immediately after the favorable crisis has taken place. In the rapid, continued fevers, and in a single paroxysm of an *intermittent*, one crisis only occurs; but in by far the greater number of protracted, and especially in *remitting* fevers, the crises continue to recur through the whole period of declension at every tertian exacerbation, until the disease is finally subdued. The duration of this stage is extremely various. In general, the period of declension will be pretty nearly in proportion to the period occupied in the progress of the fever at its acme.

The space of time which is occupied by one paroxysm of a fever and its succeeding intermission, or which intervenes between the regular periodical exacerbations of fever not paroxysmal, is called the *revolution* of a fever. The *revolutions* of fevers are various in point of duration; some fevers completing theirs in twenty-four hours, others in forty-eight, whilst others require seventy-two, and some even ninety-six hours. The form which a fever assumes, in this respect, is called its *type;* so that a fever which occupies twenty-four hours from the commencement of one paroxysm to another, is said to be of the *quotidian* type; whilst one which revolves every forty-eight hours, is of the *tertian* type; and when this period is extended to seventy-two hours, the fever is of the *quartan* type; and a period of ninety-six hours constitutes the *quintan* type. The *quotidian*, the *tertian* and the *quartan* types constitute the three principal and primary types of fevers; all of which are, however, subject to modifications which

may readily mislead the careless observer, so as to confound them, or mistake one for the other, especially the quotidian and the tertian.

It has been observed, that in fevers of the *quotidian* type, the paroxysms generally come on in the *morning*—a circumstance, which has been almost invariably verified in my own experience, and which is, indeed, so constant, that Cullen was induced to notice it in his definition of a *quotidian*. *Tertians* commonly come on towards noon; but they are much less regular, in this respect, than fevers of the preceding type. *Two* simple tertians sometimes go on cotemporaneously in the same patient; so that, instead of the paroxysms recurring only every other day, they occur daily, as in a quotidian. These cases are called *double tertians*, and are distinguished from quotidians by the paroxysms of the alternate days being similar in relation to the precise time of their occurrence, grade of violence, duration, and other circumstances. Thus the paroxysms on the *odd* days will perhaps recur at nine o'clock in the forenoon, whilst those which happen on the *even* days will come on at two or three o'clock in the afternoon, so that, although each day has its paroxysms, the fever cannot be properly considered as a quotidian, but the cotemporaneous progress of two simple tertians, the one having commenced a day sooner than the other. Fevers, however, rarely assume the double tertian type from their commencement. They usually begin and continue for some time in the simple tertian type—the duplication occurring afterwards; and when the type thus becomes doubled, the new or accessory paroxysms are generally considerably milder than those of the original or simple tertian. It is asserted, that a double tertian seldom terminates without first assuming the single tertian type—the accessory or weaker paroxysm disappearing first.*

There are other varieties of double tertians, mentioned by the older writers, such as the *tertiana duplicata*, in which two paroxysms occur every *second* day, and none on the intervening one; the *hæmitritæus* of the ancients, in which a paroxysm occurs daily, the intermissions or remissions between the first and second, the third and fourth, being much more prolonged than those which occur between the second and third, the fourth and fifth, &c. Authors also mention a *triple tertian*—tertiana triplex.

The quartan type, also, has been known to assume similar modifications. *Double* and *triple* quartans are mentioned in the books; as well as other anomalous varieties of this affection.

Before I proceed to the consideration of the particular forms of fever, it will be proper to say something concerning *crisis* or *critical days*—a subject which, though but little regarded at the present day, appears to me entirely worthy of attention. It may, I think, be assumed as a safe principle, that doctrines or sentiments concerning facts which are objects of mere observation and experience, cannot be wholly erroneous or illusory, after having obtained the entire confidence, through a series of more than twenty centuries, of a vast number of as accurate and devoted observers of nature as have ever adorned our profession. Without professing a belief in the correctness of the doctrine of crisis as it was taught by the ancients, and by many of the moderns, we may yet admit, on good grounds, it is conceived, that there exists a natural tendency in the operations of the animal economy, whether in a state of health or disease, to certain periodical fluctuations, which, under particular circumstances, manifest themselves in a way sufficiently conspicuous to exhibit an obvious revolution in the increase and declension of the morbid actions of the animal system. It was early observed, that there are certain regular periods in the course of many febrile affections, at which prominent changes are wont to occur, preceded generally by a manifest aggravation of the symptoms, and followed or attended by certain evacuations. These evacuations, from their being almost always followed by an obvious abatement in the symptoms, were called critical, and were thought to consist of noxious or febrific matters, thus thrust out of the system by the sanative powers

* Richter's Specielle Therapie, vol. i.

of nature. Fever was supposed to be nothing else than an effort of nature to prepare and cast out of the system the morbific materials which disturbed the regular actions of the animal economy, and that the amendment which ensued was the immediate consequence of such eliminations of morbific matter. At the present day it is, however, more correctly maintained that these critical discharges are the effects, and not the causes of the amelioration which occurs about the periods at which they take place; and that they are to be viewed rather as the first manifestations of a favorable change in the condition of the system than as the immediate causes of such a change. That this is the correct view in relation to the nature of such discharges, there can, indeed, exist no doubt; but this view of the subject does not deprive it of its importance, and directs our attention rather to the periodical exacerbations and inherent tendencies in these maladies to terminate their course at one period in preference to another, than merely to the evacuations which are apt to supervene at such times. In no forms of fever, perhaps, are these tendencies to terminate at a certain fixed period more frequently manifested than in intermittents. There appears, in these fevers, a tendency to a septenary revolution, which I have often seen verified in the most unequivocal manner. If an ague of the quotidian type be suffered to run on until it terminates spontaneously, the termination will almost universally occur, if it occur at all, either after the seventh, fourteenth, or twenty-first paroxysms; and I have repeatedly found, that febrifuge remedies, exhibited immediately after these septenary periods, will arrest it with more certainty, and with much less liability to relapse, than when employed during any of the intervening intermissions. From the same inherent tendency, the relapses which are so common in this disease will, in a vast majority of instances, occur about the septenary periods from the time of the last paroxysm, and most commonly about the eighth or fourteenth, and sometimes for several periods about the twentieth day. (Jackson,* Sprengle.†)

Observation has shown, that the crises of fevers happen almost uniformly on the odd days, reckoning from the commencement of the malady. According to the observations of Hippocrates, the crises occur in conformity to the *tertian* type, until the fifth crisis, or the eleventh day of the fever, after which they observe the quartan type, occurring only every fourth day. It must be observed, however, that these evacuations do not occur exclusively on the days just indicated, for they are sometimes, though rarely, found to happen on the intervening days. Galen supposed that when the crisis falls on any other than a critical day, the fever has been diverted from its natural tendency by the accidental occurrence of irritation in some part of the system. Galen divided the critical days into the *perfect*, the *secondary*, and the *intercurrent*. The *perfect* are those which happen on the seventh, fourteenth, twenty-first, and twenty-eighth days. The *secondary*, or less perfect, occur on the intermediate day between each perfect or septenary crisis—namely, the fourth, eleventh, eighteenth, twenty-fifth, &c., days. If, for example, it was observed that a slight deposit in the urine, or a moderate flow of sweat took place on the eleventh day, it was regarded as an indication of a more perfect crisis on the fourteenth day. The intercurrent crises occur on the remaining odd days—that is, on the fifth, ninth, thirteenth, &c. Such are the principal points in the doctrine of *crisis*, as it was taught by the ancients, and more especially by Hippocrates, and his commentator Galen. No one, at the present day, however, pretends to have observed the many minute distinctions and phenomena which are embraced in the ancient doctrine on this subject; indeed, there are very few who regard it as at all worth *any* attention; and the profession seem long since to have thrown it into the common mass of error and misconception which has been formed out of the wrecks of former systems and doctrines. However antiquated it may appear, at the present advanced stage of our science, to profess some faith in the general

* On the Diseases of Jamaica. † Handbuch der Pathologie, Band ii. p. 171.

correctness of this doctrine, I cannot, at the risk even of being set down as a cherisher of obsolete and exploded sentiments, divest myself of the conviction, that among much that is erroneous and absurd in this doctrine, there are important and fundamental truths which ought not to be carelessly rejected.

In order to understand the nature of crisis, every fever must be considered as having a tendency to some one of the principal *types* mentioned above. A simple tertian intermittent may be regarded as the elementary type of fever. In fevers of this type, an exacerbation or paroxysm, and a crisis, will occur on every odd day; and if we consider a *continued* fever as made up of tertian paroxysms prolonged and running into each other, or as possessing a natural, though countervailed tendency to the elementary or tertian type, there will, in like manner, occur more or less considerable tertian exacerbations, with their accompanying discharges. From what has already been said concerning the manifest septenary movements of intermittents, the tendency of continued fevers to terminate on the fourteenth or twenty-first days, which can scarcely be denied, would seem to be in conformity with an original law of the animal economy under a state of febrile excitement.

The evacuations which usually accompany the crisis of fever are,—1, hemorrhages; 2, a flow of sweat; 3, an increase or changed character of urine; and 4, diarrhœa. Critical hemorrhages are generally attended with an increased action of the heart and arteries, and often with a manifest determination to, and congestion in, the part from which the discharge occurs. They must be regarded as mere manifestations of a previous change in the system, and hence this critical kind of evacuation cannot be substituted by an artificial abstraction of blood; since, although blood may be abstracted, the peculiar action of the solids, which constitutes the actual crisis or change to a favorable tendency, cannot be thus produced. Crisis by hemorrhage, is generally confined to inflammatory fever; or, more correctly speaking, to fevers attended with an increased activity and action of the heart and arteries. Critical hemorrhages most commonly proceed from the nose, and, according to the observations of many of the older writers, are frequently preceded by the *dicrotus* pulse, in which two distinct wave-like beats occur during each diastole of the artery. Immediately before the irruption of the blood the carotids beat strongly, the face becomes flushed, sparks appear before the eyes, the eyes are red and suffused with tears; and, in some instances, frequent sneezing and a thin watery discharge from the nostrils occur just before the hemorrhage appears. Critical sanguineous discharges have also been known to occur from the uterus, the rectum, and sometimes, though very rarely, from the stomach, and even from external parts.

Crisis by an increased flow of *perspiration* is by no means uncommon. Catarrhal and rheumatic fevers are more apt to terminate by this mode of crisis than any other forms of febrile affection. This discharge is not, however, to be regarded as indicative of a favorable change in the malady, unless it be generally diffused over the whole surface, and especially, unless it be *attended with a turbid state of the urine*, or a copious sediment in this latter evacuation. The surface should, moreover, be soft, and of a natural temperature—that is, not cold and clammy.

Crisis by *urine*, independent of perspiration, is a very uncommon mode of termination in febrile complaints. A critical urine derives its favorable character not so much from the mere *quantity* of the evacuation, as from its *appearances* and the *materials* with which it is impregnated or mixed. For inspection, the urine which is evacuated at the termination of a paroxysm, or in the morning, ought to be chosen. In a truly critical urine there may be seen at first a cloud floating in the upper part of the vessel, then a globular body of mucus about the middle, and a sediment at the bottom.* So universal is the concurrence of a critical

* Vogel, Richter, Hufeland. I have frequently noticed these appearances in the urine, evacuated after a paroxysm of intermitting fever; and I am well satisfied that it is a common occurrence in the urine discharged soon after fevers have commenced to decline.

urine, and a general moisture of the skin, that these two evacuations may be considered as essentially connected.

A critical discharge from the bowels is less common than those I have already mentioned. It occurs most frequently in bilious fevers, and in such febrile affections as are attended with some visceral disease within the abdomen. These discharges do not, however, occur as the others do, in the acme or exacerbations of the fever, but during the periods of remission. They are generally very copious. The signs of an approaching crisis by diarrhœa are a peculiar trembling of the under lip; stammering speech; a full and wave-like pulse; pain and rumbling noise in the bowels; discharge of wind; a moist tongue; itching in the nose; paucity of urine, &c. (Richter.)

CHAPTER IV.

ON GENERAL DIAGNOSIS.

Nothing so much distinguishes the experienced and truly well-qualified physician from the mere hap-hazard recipe-doctor and routinist, as the ability to estimate correctly the import of symptoms; to trace their various relations with each other, and to determine from them the seat, nature, and extent of maladies. The number of those who are remarkable for accuracy in diagnosis, is always very small; for eminent proficiency in this respect can be obtained only by persevering observation and study, aided by a minute and comprehensive acquaintance with physiology and pathology.

Diagnosis embraces a much wider range of inquiry than that which is presented by the actual phenomena of diseases. It is not alone from morbid symptoms that the intimate character and tendency of diseases can always be satisfactorily determined. Age, sex, moral and physical temperament, climate, occupation, habit of living, corporeal conformation, previous diseases, hereditary predisposition, and the character of the predisposing and exciting causes, often afford important aid in the formation of a correct diagnosis. In chronic diseases, especially, the light which may be obtained from circumstances of this kind, is frequently of the utmost importance in this respect.

The manner in which patients are examined, also, has a direct and important bearing on diagnosis. A confused, desultory, or immethodical mode of investigating the symptoms of diseases, and the various circumstances which may have contributed to determine their character, seldom leads to a clear and precise diagnosis. Indeed, the manner in which a physician examines his patients affords no inconsiderable criterion for judging of his practical qualifications. Method, regularity, and deliberation, in this respect, are almost always associated with skill in diagnosis, and consequently in the treatment of diseases.

The first objects which strike the attention of the physician, on approaching a patient, are his *countenance*, *attitude*, *motions* and *voice*. It is natural, therefore, to commence the examination with these symptoms. In many instances these external conditions of the patient afford very important information as to the nature and seat of maladies; and in no case, perhaps, can they be entirely neglected without losing very useful suggestions in relation to the diagnosis.

The countenance should be deliberately and closely examined, and its deviations from the healthy aspect and expression noticed. Many diseases are attended with expressions of countenance so peculiar and striking, that they may be at once recognized by the observant and experienced physician. The *attitude*, *motions*, and external condition of the patient's body, must, also, be particularly

noticed. The degree of emaciation—the color and condition of the skin, and the general physical habit and conformation, should be observed. The various regions of the body should be carefully examined, more especially in diseases of a chronic and obscure character. In some general maladies, such as scurvy, syphilis, scrofula, &c., the ecchymoses, glandular indurations, eruptions, blotches, exostoses, nodes, &c., afford important diagnostic evidence. Old cicatrices, too, merit particular attention; particularly when seated along the neck and in the groins. The former almost always indicate a scrofulous diathesis, whilst the latter afford good grounds for suspecting the existence of a syphilitic taint. The existing disease, for which the physician is called to prescribe, may have a very intimate connection with one or the other of these maladies or constitutional taints; and as patients are apt to neglect giving proper information on this subject, or even seek to conceal the fact of their having been affected with such a disease, these old marks or cicatrices are sometimes of essential service, to a full and satisfactory investigation of the case under examination.

Having attended to these external circumstances, the examination of the case must be pursued, by *interrogating* the patient. The manner in which the examination is conducted, is of great importance. A careless, irregular and hurried, or a peevish, fretful and impatient manner of examining, seldom fails to lessen the good will and confidence of the patient for his medical attendant; whilst a mild, deliberate, earnest and interested deportment, not only gains the patient's confidence and respect, but contributes very materially to a full development and correct understanding of the nature of the malady. The questions should always be proposed in terms perfectly intelligible to the patient; and when there is reason to doubt whether the interrogatory has been correctly apprehended, it should be repeated in different terms. The employment of a pompous and technical phraseology is more apt to excite the contempt and distrust of intelligent patients, than to draw forth correct and satisfactory responses.

It is of considerable consequence, also, to follow a determined and regular order in the questions put to the patient. Without a proper attention to order or method in this respect, important questions are apt to be forgotten, and some which have already been proposed and answered, uselessly repeated. Although the interrogatories should be sufficiently numerous and varied to obtain a full view of the symptoms and feelings of the patient, and of the circumstances which may have contributed to the development and modification of the disease, yet trivial and irrelevant questions should be avoided.

The following order of inquiry appears to me the most natural and advantageous. 1. Ascertain the *age*, *occupation* and *place of residence* of the patient. In many instances, indeed, these circumstances, more especially the last, can have no useful bearing on the diagnosis; but this is by no means always the case; for, in some cases, very important diagnostic and practical suggestions may be obtained from a careful consideration of these facts. 2. Inquire next, at *what time* the disease commenced; whether it came on gradually or suddenly; whether the existing symptoms differ from those which attended the disease at an earlier period; whether the progress of the complaint is continuous or paroxysmal, constant or occasional, uniform or attended with exacerbations and remissions; whether, in the course of the disease, new symptoms have supervened, and former ones disappeared, and whether the permanent symptoms have increased much in violence since the commencement of the complaint. Correct information in relation to these circumstances is often indispensable to a satisfactory diagnosis. "In many instances, indeed, the *succession* and general progress of the symptoms afford more useful data for the formation of a correct diagnosis, than a consideration of the symptoms existing at the time of examination. Unfortunately, the majority of patients are incapable of giving a proper account of the early symptoms and progress of their maladies; and the physician is thus frequently deprived of the light which a correct and circumstantial exposition of the preceding symptoms and course of the case might afford." 3. The

patient should now be asked whether he experiences any pain, and if so, in what part of the body. He should be directed to place his hands on the region in which the pain is felt; for patients are apt to express themselves very vaguely and incorrectly in relation to the part in which the pain is seated. Thus, we are often told that pain is felt in the *stomach*, yet when the region is pointed out with the hand, it is, perhaps, found to be seated in the lower part of the abdomen, or within the chest. Inquiry must also be made whether the pain be acute or darting; dull and aching; stinging or burning, or throbbing;—whether it be deep seated or superficial, continuous or intermitting, wandering or fixed, transient or protracted; and, if intermitting or paroxysmal, whether its occurrence be periodical or at irregular and uncertain intervals. Pressure should be made on the part in which the pain is located, and its effects carefully noticed; and it is particularly important to ascertain whether there is soreness or tenderness to pressure in certain organs or regions of the body, more especially in the various regions of the abdomen; although the patient may not complain of any pain in these parts, when undisturbed by pressure. It will also be proper to ascertain whether the affected parts are swollen, discolored, or in any other way changed from their normal or healthy appearance and conformation. 4. The state of the sanguiferous system should next be inquired into. The *pulse* must be attentively and deliberately examined; and in doing this, attention must be paid to the circumstance, that the pulse of an infant, during the first three or four weeks after birth, beats between 120 and 130 strokes in a minute; and that its natural frequency undergoes a gradual reduction as age advances, until about the age of puberty, when it arrives at the standard of a healthy adult pulse, namely, from about 72 to 80 pulsations in a minute. It should be observed, too, that *climate*, the time of day, corporeal exertion, position of the body, and mental emotions or exercise, exert, often, a very material influence on the state of the pulse. In the morning, whether in health or disease, the pulse is generally considerably slower and softer than after dinner or towards evening. In feeble and nervous individuals, we often find the pulse much more frequent when they are standing up, than when in a recumbent position. In this case, the muscular exertion required to maintain the erect posture operates on the circulation in the same way as exercise, and therefore accelerates the action of the heart and arteries. Nothing, however, is so apt to give rise to a wrong estimate of the state of the pulse, as that mental excitement and flurry which feeble and irritable patients are apt to experience on the entrance of the physician into the sick chamber. I have frequently found a difference of more than twenty pulsations in a minute, between an examination made immediately after entering the room, and a second one, some ten or fifteen minutes afterwards. It is therefore an important rule, to delay examining the pulse, until the agitation of the patient's mind has subsided. By introducing the examination with some encouraging and cheering remarks, and proceeding in the order already mentioned, there can seldom be any risk of mistake, from this source, as to the actual state of the pulse. In examining the pulse, the patient's arm should be held in a horizontal and semiflexed position. Two or three fingers must be applied to the artery, and the pressure gradually varied in force, in order to form a correct estimate of the degree of tension, vigor, hardness or compressibility of the pulse. Thirty or forty pulsations, at least, ought to be felt before the fingers are taken off. It is not uncommon in certain obscure cerebral affections, to find an intermission in the pulsations, at intervals of from ten to thirty and even a greater number of beats. A transient examination may not only fail to detect such intermissions, but is in general, quite insufficient for obtaining a satisfactory view of the precise character of the pulse. All conversation should be forbidden, both on the part of the patient and the attendants. In certain affections, and when the system is under the influence of certain remedial agents, (as *digitalis*,) it will be proper to examine the pulse in different positions of the patient's body; namely, in the recumbent, sitting and standing postures. This is particularly useful in certain organic affections of the heart. There is,

perhaps, no department of symptomatology in which a high degree of proficiency is so seldom met with among physicians, as that which relates to the morbid manifestations of the pulse. Many seem to think that the only modifications of the pulse which are worthy of particular attention, relate to its frequency, fullness, hardness, tension and regularity. There are various other states of the pulse, however, which, though not easily described, communicate to the experienced and diligent observer definite and important views concerning the pathological conditions with which they are associated. The ancients, and even some of the moderns, undoubtedly carried their refinements and pretensions, in relation to this subject, to an absurd extent. It is not improbable, however, that among much useless rubbish, which in the progress of our science, has been swept away concerning the *organic* pulses, as they were called, some valuable facts and principles were included, which might be advantageously revived. Be this as it may, a faithful and continued attention to the morbid states of the pulse, with diligent and well directed efforts to obtain definite conceptions of its various modifications, and to associate them with their respective pathological conditions, will, in general, result in the acquirement of a precision and readiness of discrimination, and accuracy of diagnostic application, which few who have not made the pulse a particular object of study and observation can well conceive or credit. 5. Having ascertained the condition of the pulse, the attention should be particularly directed to the organ or part in which the primary or essential malady appears to be seated. Inquiry must next be directed to those structures or organs which are known to hold the most intimate sympathetic relations with the part or organs principally affected. Thus, if the patient complains of much pain, or of other unpleasant sensations in the head, after having obtained a circumstantial account of the cephalic symptoms, the examination should be directed to the state of the *alimentary canal*. Again, if there is a fixed pain in the lumbar region, the important question whether the pain be located in the kidneys, or in some neighbouring structure, may, in general, be readily settled, by attending to the condition of those organs with which the kidneys sympathize most strongly; namely, the stomach, the ureters, and the testes. If there is a retraction of the testes, pains shooting down along the ureters, with nausea and vomiting, the fact of its being a renal affection may be regarded as sufficiently ascertained.

In the investigation of diseases, it should be recollected that the prominent and most annoying symptoms are by no means always located in the part where the primary and actual malady is seated. A slight inflammatory affection at the origin of a spinal nerve, not unfrequently manifests itself by severe and protracted pain in some remote part of the body; as in the chest, the abdomen, or the inferior extremities. When, therefore, a fixed pain is unattended with any other manifestations of disease in the part; when there is neither inflammation, nor soreness nor tenderness to pressure, we may presume that the primary affection, upon which the disease depends, is located in some other part of the body; and on proper inquiry, it will perhaps be found to be seated at the spinal origin of these nerves, which are distributed to the structure in which the pain is felt. To ascertain whether this be the case, firm pressure must be made on each of the spinous processes of the vertebral column. If, in passing successively from one spinous process to another, the patient flinches and complains of pain in one or more vertebræ, it may be inferred that the source of the painful affection is probably seated at the root of the nerves which pass out from that part of the spine.

Many diseases, which appear to be of a general character, consisting seemingly in mere functional derangement, are nevertheless intimately connected with obscure and frequently very serious local affections. The diagnosis, in such cases, is generally extremely difficult. In some instances, a probable opinion as to the existence, seat and character of such obscure and local affections, can be formed only by taking into view the effects of certain remedies and the nature of the exciting causes, in connection with the actual symptoms and general progress of the malady. Inflammation of some portion of the mucous membrane of the

alimentary canal, often attends general diseases with manifestations so slight and inconspicuous as sometimes to escape the notice of even attentive observers. In relation to the diagnosis on this point, especial attention must be paid, in the examination of the symptoms, to the appearance of the tongue; the condition of the alvine evacuations; the effects of irritating ingesta; the effects of firm pressure on different parts of the abdomen, with regard to the sensations which it excites; the state of the skin; and if the malady is of a chronic character, the temper and condition of the mental faculties. It should be particularly noticed, whether the surface of the tongue be red, and of a granular or smooth appearance—whether irritating and solid ingesta give rise to pain and distress in the stomach, or tormina in the bowels; whether pressure on any part of the abdomen gives rise to a pain or a feeling of soreness; whether the skin in connection with these symptoms be dry, harsh, and contracted, and whether the temper is morose, gloomy, taciturn and irritable. The particular appellation of these phenomena will be fully illustrated in a subsequent part of this chapter.

I proceed now to the consideration of the particular diagnostic signs as presented by the countenance, the attitude, the nervous system, the alimentary canal, the blood-vessels, the respiratory organs, the cuticular surface, the lymphatic system, and the secretions.

1. *The countenance* is variously and often strikingly changed by diseases, and affords, in many instances, highly important diagnostic indications. Hippocrates strongly recommends the study and examination of the countenance in disease. His attention, however, was directed principally to the *prognostic* signs manifested by the countenance, and the observations which he has left us, on this subject, are among his most valuable contributions to our science. In relation to *diagnosis*, however, we find but few observations in his writings, concerning the morbid expressions of the countenance. This point has been more particularly attended to in latter times; and although there is still much room for profitable inquiry, yet the facts and principles which have already been established, are sufficiently numerous and interesting to show the importance of attending to the countenance, as a source of valuable diagnostic information.

M. Jadelot, physician to the *Hôpital des Enfans Trouvées*, has published some interesting observations on the physiognomical expression of certain forms of disease in children. According to his observations, there are three principal physiognomical *traits*, which, in children, are often very conspicuous—each indicating a peculiar morbid condition of the system.

The first consists of a distinct pale or lead-colored streak, with an appearance of depression, commencing at the greater angle of the eye, and terminating a little below the projection formed by the cheek bone. This he calls the oculo-zygomatic *trait*. This trait indicates disorder of the "cerebro-nervous system." It is strongly marked in all those maladies whose primary and principal seat is in the brain or on the nerves. It is likewise present whenever the nervous system, more especially the brain, participates actively in affections which are in the first place located in other structures or organs; but in cases of this kind, some other *facial trait* usually co-exists, which indicates the character of the complication. Thus, for instance, when intestinal irritation from worms or other causes, finally occasions hydrocephalus, epilepsy, &c., the *oculo-zygomatic trait* will be added to the previous physiognomical expression indicative of the intestinal disorder.

The second trait begins at the upper part of the alæ nasi, and embraces, in a semicircle more or less complete, the outer line of the orbicularis oris. It is not uncommon to observe, towards the middle of the cheek and forming a tangent with this trait, another one which in certain faces constitutes the dimple of the cheek. These two traits, says M. Jadelot, are referable to similar affections. The first he calls *nasal*, the second *genal*. This trait, and its accessory, indicate disorder, particularly chronic irritation or inflammation of the alimentary canal, and of the abdominal viscera. It is observed in diarrhœa, indigestion, verminous irritation, &c.

The third trait begins at the angle of the lips, and is lost on the margin of the chin. This is called the *labial trait*. It seldom forms a deep line, being modified by the changes which the neighboring parts undergo. The other traits are more or less deeply marked according as the diseases to which they belong are more or less severe or protracted in their course. This trait attends diseases of the heart and of the respiratory organs, and may almost always be observed in cynanchæ, carditis, hydro-pericardium, organic affections of the heart, pneumonia, &c.

M. Sallé observes, that at the onset of all severe diseases, the inspection of the child's countenance may serve as a useful guide to the physician in discovering the organ principally affected. "The presence or absence of the oculo-zygomatic trait, in the initial stage of the disease, will inform him whether the cerebro-nervous system be primarily affected, or whether its supervention be merely the result of sympathy." He asserts that at a single glance he has often been enabled to pronounce with confidence the existence of abdominal disease, by observing the presence of the nasal trait. It is said to be particularly conspicuous in dysentery and chronic diarrhœa.

I have, for several years past, attended very carefully to these observations of M. Jadelot, and am entirely persuaded that they are correct, and of essential service in the diagnosis of certain diseases of children.

In addition to these physiognomical expressions, the singular change of countenance which, according to Dr. Wolff,* occurs in children laboring under chronic or sub-acute peritonitis, deserves to be mentioned. This writer asserts that in the hydropic stage of this affection, "the skin at the root of the nose immediately between the eyes," acquires a swollen or bloated appearance, by which the general expression of the countenance is strikingly altered. "The parents of my patients," he says, "frequently noticed a change in the expression of the countenance, without being able to say in what it consisted; but as soon as I directed their attention to the tumefaction of the skin at the spot mentioned, they agreed with me that the change in the appearance of the child's countenance arose from it, and were surprised that they had not discovered it themselves." This singular *trait*, he asserts, is one of the most constant and certain diagnostic signs of the disease, after serous effusion in the abdomen has commenced.

Sprengle observes, that chronic disease of the spleen is, almost invariably, attended with a remarkable *bluish tinge* of the tunica albuginea. I have verified this observation in several instances.—During my term of attendance last winter at the Commercial Hospital of this place, a patient was brought into the house, laboring under some chronic malady. At the first glance of his countenance, I noticed the singular blue tinge of the albuginea. I pointed it out to the students in attendance, and stated the diagnostic inference which, according to the observations of Sprengle, this appearance justified—namely, that the patient was laboring under some chronic affection of the spleen. This man has since died, and on post-mortem examination, the spleen was found very much enlarged, and otherwise disordered in its structure.

Pain, whether from spasm or inflammation, always causes a peculiar contraction of the muscles of the countenance. The physiognomical expression of pain is, indeed, so characteristic, that the most inexperienced will readily interpret it correctly. An attentive and experienced observer may even perceive, in the peculiar contraction of the features, in what class of organs, or in what organ, the cause of the pain is seated. Thus, when the diaphragm is inflamed, the pain, from the situation in which it is felt, might be supposed to be seated in the stomach, the liver, or the spleen; but the peculiar grinning expression of the countenance (*risus sardonicus*), which attends injuries, or inflammation of the diaphragm, indicates at once the true seat of the disease.

* Hufeland's and Osan's Jour der Practischen, Heilkunde, May, 1829.

Pain depending on inflammation of the mucous membrane of the alimentary canal, generally gives an expression of gloom, irascibility and discontent to the countenance; and this is more especially the case when the stomach and duodenum are affected. When the *lungs* are the seat of painful sensation, there is an expression of great anxiety depicted in the countenance, attended with an unusual expansion of the nostrils during each inspiration. Even when there is no *acute* pain, in affections of the lungs, this peculiar anxious expression of the countenance and expansion of the alæ nasi generally occur, in consequence of the congested condition of these organs impeding the respiratory functions. Dr. Marshall Hall observes, that the more acute the pain is, in inflammation of the thorax, the more contracted, in general, will be the features. When the pain is very severe, the alæ nasi are acute and elevated, and the nostrils are strongly contracted and expanded, by the alternate acts of respiration. In addition to this, there is sometimes a vivid flush on the cheeks, terminating abruptly, and bounded by a very pale streak towards the nose. In great difficulty of breathing, *from a congested* state of the lungs, the countenance is not only marked by an expression of anxiety, but becomes, also, more or less suffused with a dark or livid hue, accompanied with turgidity or fullness. Whenever, therefore, this livid appearance, and turgidity of the vessels of the face occur, in diseases of the lungs, we may be assured that there exists either great sanguineous congestion in these organs, or an effusion of fluid into them. This is still more certainly the case, if, with these physiognomical signs, the surface of the body is rather below the natural temperature.

The countenance peculiar to *tubercular phthisis* is so striking that even the most careless observers, in general, readily recognize it. The delicate paleness of the face, the circumscribed flush on the cheeks in the afternoon, the pearly whiteness of the tunica albuginea, the quivering motion of the lips and chin in speaking, are well known as the invariable and ill-boding attendants of pulmonary consumption.

In "inflammation of the abdominal viscera," says Dr. Hall, "attended with severe pain, the muscles of the face are in a state of continued contraction; the features are unnaturally acute, the forehead is wrinkled, and the brows knit. The nostrils are acute and drawn up; the wrinkles, which pass from them obliquely downwards, are deeply marked, the upper lip is drawn upwards, and the under one frequently downwards, so as to expose the teeth. The state of the features is aggravated on any increase of the pain from change of position or external pressure. When the abdominal pain arises from *spasm*, the muscles of the face are exceedingly contracted and distorted during the paroxysms of pain; but in the intervals of the paroxysms, the countenance assumes a calm and placid aspect."

In organic affections of the heart, the countenance generally acquires a very peculiar expression. In cases of this kind, the prolabia are more or less vivid, the face puffy or œdematous, and of a peculiar dingy hue, or suffused with a livid flush. This circumstance is worthy of notice, in relation to the diagnosis between organic affections of the heart and hydrothorax. In the latter affection, the countenance almost always exhibits a pale, or pale livid aspect, instead of the vivid flush so common in cardiac diseases. (Hall.)

In the *soporose* affections, also, the countenance is variously and characteristically affected, and affords important diagnostic indications. In the apoplectic attack, the face is generally flushed, or livid, and the blood-vessels of the head and neck turgid. The muscles of the face are frequently paralytic on one side, so as to destroy the natural symmetry of the features, the mouth is drawn towards the unaffected side, whilst the eyebrows, nostril, angle of the mouth, and cheek of the paralyzed side sink down. The flush and fullness of the face do not, however, continue throughout the whole course of the disease; towards the fatal termination of the attack, the countenance usually becomes pale, and somewhat contracted. In syncope, the countenance is pale, shrunk, and covered with

a cold perspiration, presenting a death-like appearance; and in that state of insensibility which sometimes occurs in hysteria, the countenance is nearly natural, both in color and expression. In the two latter affections there is no unusual sanguineous congestion in the head. The blood is accumulated in the lungs and heart, and hence, when recovering from the state of insensibility, patients generally experience a sense of great weight and pressure in the chest, more especially in the region of the heart.

Chlorosis is always attended with a very peculiar and characteristic appearance of the countenance. "The incipient stage is denoted by paleness of the complexion—an exsanguious state of the prolabia, a slight appearance of tumidity of the face, or fullness of the eyelids." In some instances, a tinge of green or of yellow is observable in the pallor of the countenance, and the eyelids are of a dark lead-colored hue. "In the confirmed stage of the disease, the face is still more pallid; the prolabia acquire a slight lilac hue, and the integuments, in general, a puffy and tumid appearance. In the more chronic form of this malady, the countenance exhibits an appearance of *sallowness*, of squalid or dingy paleness, with a ring of darkness occupying the eyelids, extending a little towards the temples and cheeks; and, in some instances, a similar dark streak surrounds the mouth." Dr. Hall observes, that this sallowness or *icterode* appearance of the countenance must not be confounded with the different shades of *icterus*, or bilious tinge. In icterus or jaundice, that is, when the discoloration depends on the deposition of bilious matter, the *tunica albuginea* of the eyes is invariably more deeply tinged with yellow, than any other portion of the surface; whereas, in the more *icterode*, or sallow appearance of the complexion, observed in chlorosis, and in some other chronic affections, the eyes do not exhibit any distinct tinge of yellow. When, therefore, the countenance of a patient presents a yellowish hue, without a similar tinge of the albuginea, we may conclude, that it does not depend on the presence of bilious matter in the circulation, or on biliary derangement.

In chronic irritation of the bowels, from worms, or other irritating substances lodged in the alimentary canal, a remarkable pale tumefaction of the upper lip frequently occurs, in connection with the *nasal* and *genal* traits, mentioned above. This swollen state of the lips is generally but transient in verminous affections. It usually comes on at night, during sleep, and seldom continues more than two or three days. A somewhat similar swollen state of the upper lip often occurs in children affected with scrofula; more especially when the disease is principally seated in the mesenteric glands. In cases of this kind, however, the tumefaction is much more permanent; there is also more lividity of the prolabia and the cheeks, and the peculiar *traits* mentioned by Jadelot, (the nasal and genal,) are not present.

In inflammation of the arachnoid membrane, the expression of the countenance is generally strikingly characteristic. Besides a general expression of surprise, confusion, and discontent which it is impossible to describe, but which cannot easily be mistaken when once seen and contemplated, the most prominent morbid expressions of the countenance are those furnished by the eye. According to the observations of Martinet and Duchatelet, the pupils are either much dilated or contracted; the conjunctiva presents a greater or less degree of redness; and when the inflammation has made considerable progress, and is about terminating in effusion, or structural lesion of the brain, there are squinting, and constant rolling of the eyes, or they are turned upwards so as to conceal the cornea. In nearly all instances, *the upper eyelids become paralyzed*, so that the patient, in endeavoring to look at any object, is unable to raise the lids by their proper muscles, and is, therefore, obliged to draw them upwards, together with the integuments of the forehead, by the contraction of the occipito-frontalis muscle.* Martinet observes, that these latter symptoms, namely, the turning up of

* Recherches sur l'Inflammation de l'Arachnoid, Cerebrale et Spinale. Par Duchatelet et L. Martinet, Paris, 1821.

the eyes and paralysis of the upper eyelids, are the most constant symptoms manifested by the countenance in this disease. Whytt and Camper also declare that they are among the most certain diagnostic signs of this dangerous malady.

Sprengle (*Handbuch der Semiotik*) says, that the appearance of the tunica albuginea affords an excellent diagnostic sign between scarlatina and measles. In the former, he asserts, the albuginea exhibits a *uniform* red tinge, with little or no suffusion of tears; in the latter malady, the redness is not general or uniform, the injected capillaries of the conjunctiva leaving intermediate spaces of a natural or white color. (*Ziegler's Beobachtungen*, p. 24.)

The countenance in common synochus, or general inflammatory fever, usually exhibits a very different aspect from that which occurs in fevers depending on acute local inflammation seated in the thorax or abdomen. In the former, the face is more or less tumid and flushed, the conjunctiva of the eyes is injected or red, and "the nostrils are rapidly and conspicuously dilated and contracted by the hurried respiration." In acute *symptomatic* fever, on the contrary, the countenance is generally somewhat pale and contracted, and there is no hurried movement of the nostrils, nor redness of the eyes, if the inflammation be not seated in the head. In the acute *bronchitis* of infants the face is invariably remarkably pale: whereas, in infantile remittent and common synochus fever, from cold, it is almost constantly suffused with a flush. It must be observed, however, that in the advanced stage of pneumonic inflammations, whether in infants or adults, when the minute bronchial ramifications have become loaded with mucus, or serous effusion has taken place into the pulmonary tissue, the countenance acquires a more or less distinct *livid* hue—a phenomenon always indicative of great danger. On the other hand, the countenance, which is flushed in the early stage of synochal or remitting fever, becomes pale and somewhat shrunk towards the termination of the disease.

I pass on in the next place, to notice those diagnostic circumstances which relate to the *attitude* and *motions* of the patient. The morbid variations of attitude are best understood, by contrasting them with the healthy postures of the body during sleep. "It may be presumed, that, both in health and in disease, that posture is assumed which affords the most repose to the system in general, and most relief in the performance of its various functions. In healthy and undisturbed sleep the usual posture is that of one side; the head and shoulders are generally somewhat raised, and, together with the thorax, bent gently forwards; the thighs and legs are in a state of easy flexion. The position is apt to be changed from time to time, the person lying on one or the other side alternately. The posture of the body during sleep, here described, is such as affords the most ease and repose to the different viscera, and most facility and disencumbrance in the performance of their functions, and such as allows of the greatest muscular relaxation compatible with these more essential points."

The *supine* position (*decubitus dorsalis*) when attended with twitching of the tendons, or tremor of the extremities, always indicates great muscular debility. When in the progress of a continued fever, we find the patient to assume this posture with the inferior extremities extended, we may presume from this symptom alone, that the disease is assuming a sinking or typhus character. This is still more decidedly the case, when in connection with this position the patient gradually slides down towards the foot of the bed. It requires much less muscular exertion to maintain the supine posture than any other that can be assumed. In a very debilitated condition of the system, there is not enough of muscular power to preserve the body in the *lateral* posture. If the patient be placed on one side, he soon turns on his back, and is utterly unable by his own exertions to resume the lateral position. Celsus observes, that when a person affected with fever lies on one side, with the legs slightly retracted, he may be regarded as not in a very dangerous condition.

In relation to the degree of muscular energy manifested by patients, there exists a marked difference between idiopathic and symptomatic fevers. In common

acute fevers of an *idiopathic* character, the patient soon feels very weak, and cannot support himself in the erect posture, without great and exhausting efforts, and a feeling of faintness. This is rarely the case in *symptomatic* fever. In fevers of this kind, the sense of prostration is seldom great, nor do we observe the muscular tremor, vertigo and faintness on assuming the erect position.

In diseases of the chest, the position assumed by the patient is often highly characteristic. In *hydrothorax*, the patient usually lies with the head and shoulders considerably elevated, by additional pillows. When out of bed, he is often observed to sit up, with the arms placed along the side, and the hands fixed and pressing forcibly on the chair or sofa on which he sits; in other cases he leans a little backwards, still supported by the arms and hands, which are placed behind his back. "This kind of posture is often constant, or immediately resumed, if any accident occasions it to be changed; it gives rise to an elevation of the shoulders, from which the body is supported, or as it were suspended." The attitude of course varies with the degree and progress of the hydropic effusion in the chest. In order that the patient may continue to enjoy some rest while lying down, the head and shoulders must be more and more raised, until, at last, he is sometimes incapable of remaining in bed, and is obliged to sit up "with the legs hanging down." When hydrothorax is associated with organic disease of the heart, or of the lungs, the necessity of remaining in the erect posture is, in general, particularly urgent. These circumstances admit of a ready explanation. The effused fluid in the chest produces distress and difficulty of breathing in proportion as it presses upon and impedes the free action of the lungs. In a recumbent position, with the head and shoulders low, it is obvious that the fluid must envelop and encumber a much larger portion of the lungs than when the patient is sitting up or lying with the shoulders elevated; for in this posture the fluid sinks down to the bottom of the thorax and leaves a considerable part of the lungs free from its embarrassing pressure. Hydropic accumulation in the chest may be distinguished from mere organic disease of the heart or of the lungs, attended with symptoms resembling those of hydrothorax, by making firm pressure on the abdomen and attending to the effects. If there is thoracic effusion, the patient will experience general agitation, cough, and a sense of suffocation when pressure is thus made on the abdomen. This arises from the abdominal viscera being pressed up against the diaphragm, by which the fluid in the chest is raised, so as to embarrass the lungs and cause the phenomena just mentioned. In organic affections of the heart, without thoracic effusion, no effects result from abdominal pressure. In affections of this kind, as well as in hydrothorax, the patient is unable to remain easy in a recumbent posture with the head low, more especially in very severe cases. But in addition to this circumstance, the effects which arise from corporeal exertion in organic affections of the heart, are much more violent and distressing than in hydrothorax. Almost every muscular effort or unusual exercise produces, to an extreme degree, dyspnœa, anxiety, and agitation. Ascending stairs, or a hill, seldom fails to bring on a paroxysm of the most alarming palpitation, and suffocative breathing. Although similar effects result from the operation of these causes in hydrothorax, yet they are much less violent and alarming than in cardiac diseases. When in hydrothorax, the dropsical effusion exists only on one side of the chest, the patient invariably lies on the affected side.

Inflammation in the abdomen, with acute pain, is in general attended with a characteristic position of the body, and which distinguishes affections of this kind, very pointedly, from *spasmodic pains* of the stomach and bowels. In acute abdominal inflammation the patient assumes a certain position, and carefully avoids active muscular exertion and change of posture. In *spasmodic pains* in the abdomen, or *colic*, on the contrary, the patient usually "writhes to and fro," and constantly changes his posture. In abdominal inflammation the patient lies on the back, with the knees drawn up, and the head and shoulders raised by additional pillows, so as to relax the abdominal muscles and obviate as

much as possible pressure on the inflamed viscus. Great care, moreover, is taken to prevent any pressure from the hands or bedclothes on the abdomen, and all the necessary motions of the body are performed with peculiar caution and slowness. In *spasmodic* or *colic pains*, so far from avoiding pressure on the abdomen, the patient often lies on the belly, or presses forcibly on the bowels with his hands. After the paroxysm of pain in colic is over, the patient resumes an easy position; but in the absence of an aggravation of inflammatory pain, the same cautious posture and manner are still retained as before. (Hall.)

When the inflammation is seated in one of the kidneys, the patient when in bed, inclines his body a little forwards and towards the side affected. By this position the muscles of the loins on the affected side will be somewhat relaxed and the pressure on the inflamed kidney diminished. When, in the advanced stages of typhous or typhoid fevers, attended with delirium, the patient is observed to keep his inferior extremities constantly drawn up, while recumbent on the back, *retention of the urine may be suspected.* I have known patients affected with typhoid fever, and in such a condition as not to be able to give an account of their sensations, in whom protracted retention of the urine was detected solely by noticing this retraction of the legs, or constant raised position of the knees.

In most instances of inflammation of the liver, the patient cannot lie on the left side without great aggravation of his sufferings. This symptom is, indeed, not always present in hepatitis, and when taken by itself, cannot be regarded as of any particular diagnostic importance. When it occurs, however, in connection with other symptoms indicative of hepatic inflammation, it may be considered as no inconsiderable evidence of the existence of this affection. If in a case of hepatitis, the patient is observed to lie easiest on the *left* side, we may infer that the inflammation is principally seated on the concave surface of the liver.

Next in order are the diagnostic signs manifested by the tongue, gums, cavity of the mouth, fauces, and teeth. In examining the tongue, particular attention should be paid to its color, form, surface, and mode of protrusion. In the simple forms of fever, unattended with inflammatory irritation of the mucous membrane of the stomach, the tongue is slightly coated with a *white* fur. This state of the tongue is rarely attended with dryness, and does not, in general, indicate a very great degree of gastric derangement. When in the progress of a disease the tongue changes from a white and somewhat loaded state, to a clean and deep red appearance, we may infer with confidence, that inflammation has supervened in the mucous membrane of the stomach. A *clean* and *red* appearance of the tongue, attended either with a rough or a smooth surface, is always to be regarded as conclusive evidence of an inflamed or highly irritated condition of the mucous membrane of the alimentary canal. In dysentery, we generally find the point and margin of the tongue of a deep red appearance, whilst the centre is loaded with a streak of brown and dry fur. This is particularly apt to be the case in the chronic form of the disease. In chronic gastritis and enteritis, the tongue almost invariably exhibits a dark red appearance. In some instances, this redness is attended with a rough or granulated surface, and in others it presents a smooth or glossy appearance; sometimes the whole surface of the tongue exhibits this red and rough or glossy appearance. This is generally the case when the inflammation is seated in the stomach. In many instances, however, these appearances are confined to the tip and margins of the tongue, more especially when the inflammatory irritation is located in the mucous membrane of the colon.

In fevers depending on acute inflammation, not seated in the mucous membrane of the alimentary canal, the tongue seldom exhibits any prominent deviations from its natural state. Thus in fevers from wounds, from regular gout, and from external phlegmonous inflammation, the tongue generally varies from its healthy condition only by being covered with a thick white fur, and by unnatural

dryness. (Hall.) In the commencement of typhus fever, the tongue is coated with a white fur, as in common synochus fever; but the white tongue of typhus differs from that of simple acute fever, in being covered with a thick layer of transparent, tenacious slime, which in the progress of the disease becomes dry, brown, and finally nearly black. The appearance of the tongue affords a good distinguishing sign between tubercular phthisis pulmonalis, and hectic fever with cough from hepatic or gastric disease. In genuine pulmonary consumption the tongue very generally retains nearly its natural appearance; whereas in affections of the stomach and liver simulating phthisis pulmonalis, the tongue is always more or less coated with a brown fur, accompanied usually with a depraved taste.

In the early stage of chlorosis, the tongue presents a pale and tumid appearance, with enlarged and prominent papillæ. As the disease advances the tongue becomes more and more pallid, clean and smooth, and finally acquires a peculiar flabby and semi-transparent appearance. The gums and prolabia are very pale and exsanguious, and generally somewhat swollen. Hall gives the following description of the morbid appearances of the tongue in *dyspepsia*. "In acute dyspepsia, the tongue is in general loaded, the mouth clammy, the taste bitter or nauseous, the breath fetid, whilst the surface of the face is generally oily. In some severe cases the coat on the tongue is very thick, and eventually peals off, leaving its surface smooth, red and tender, attended with an œdematous appearance of its substance. In very protracted and severe cases of dyspepsia the tongue is apt to become clean, with universal enlargement of the papillæ over the surface as in the beginning of chlorosis; or its surface is formed into lobules resembling in form those of the base of the cerebellum. In cases attended with chronic inflammation of the mucous membrane of the stomach, the surface of the tongue becomes red, smooth and glazed." The appearance of the tongue in chlorosis does not differ materially from that which it presents in chronic dyspepsia, except that in the former disease it is pale instead of red, and indicates, in addition to gastric derangement, a defect in the process of sanguification. (Hall.)

A contracted and pointed tongue is a very common attendant on inflammatory affections of the brain and its meninges. This state of the tongue is often to be observed in very severe cases of typhus; and when it does occur we almost invariably find it associated with other indications of cerebral inflammation—such as red and prominent eyes, constant delirium, flushed cheeks, &c. In fevers attended with stupor or general torpor, depending on congestion, the tongue, instead of being contracted and pointed, presents a dilated and flabby appearance. This relaxed and dilated state of the tongue is seldom accompanied by delirium; but instead of this, there is usually a *general* diminution of sensibility and irritability, as well as of muscular power and the temperature of the surface. Dr. Miner mentions this appearance of the tongue as one of the most constant symptoms of *typhus syncopalis*.

A tongue covered with yellow or yellowish-brown fur, attended with a bitter taste, indicates prominent derangement of the biliary organs. A *tremulous* tongue is, in general, one of the first symptoms of the passage of the synochus fever into a typhous or low state.

In the early stage of *scarlatina*, a number of florid papillæ protrude through the white coat on the surface of the tongue; and Bateman states that this appearance will always enable us to distinguish it from measles. In chronic hepatitis, the gums have a peculiar firm, smooth, or glossy appearance, whereas in chronic dyspepsia, they usually present a soft or spongy condition.

The next class of symptoms to be considered are those manifested by the *nervous system*. The most common, and generally the earliest symptom of deranged function of the brain, is disturbed sleep. In the diseases of children an unusual drowsiness, especially when attended with a disordered state of the alimentary canal and febrile irritation, is often one of the first symptoms to awaken

alarm and suspicion of probable disease within the head. Under whatever circumstances profound morbid sleep or coma may occur, it always denotes cerebral oppression from congestion or effusion, or some other cause capable of compressing this organ. When, therefore, in the course of diseases attended with symptoms of cerebral irritation or inflammation, somnolency supervenes, we may conclude that great congestion, or effusion, or disorganization of the cerebral structure, has taken place.

Wakefulness is indicative of great cerebral irritation or exhaustion. It is particularly apt to occur from sympathetic excitement of the brain, depending on intestinal irritation and exhaustion from loss of blood. When morbid wakefulness depends on these causes, it is almost invariably attended with great restlessness or jactitation, a distressing feeling of anxiety in the region of the heart, and a pale and contracted countenance. Sudden starting during sleep is generally connected with intestinal irritation from indigestion or worms. (Hall.) Children whose bowels are loaded with sordes or worms are particularly apt to start in sleep, "and this symptom is one of the most certain diagnostic signs of such a condition of the alimentary canal." Similar hurried wakenings occur in organic affections of the heart, and in hydropericardium, and frequently, also, in hydrothorax; but in these complaints, the starts from sleep are almost always attended with a distressing sense of suffocation, or impending dissolution, great agitation and alarm.

Acuteness of hearing and sight occurs in the incipient stage of cerebral inflammation; but they are equally, and often more strikingly presented in sympathetic irritation of the brain from intestinal irritation, accompanied with exhaustion. (Hall.) As a general observation, however, it may be said that when the senses of sight and hearing are morbidly acute, or when there is intolerance of light and sound, the brain is in a state of irritation, whether sympathetic or idiopathic. Obtuseness of hearing is a common symptom in the advanced stages of typhoid fevers, and indicates a considerable degree of sanguineous engorgement, but not inflammation of the brain.

Strabismus, and seeing objects double, always denote very considerable cerebral disturbance. These symptoms arise from sanguineous or serous effusion into, or upon the surface of the brain, and from disorganization of a portion of the structure. Torpor or defect in the sense of touch, if general or confined to one side of the body, indicates an oppressed state of the brain, and may be both the precursor or consequence of apoplexy. When torpor of feeling is confined to one extremity, or only to a part of an extremity, we may infer that the nervous communication between the affected part and the sensorium commune has been partially interrupted, by compression of the principal nerve leading to the part, or that the nervous extremities of the part have become diseased and incapable of transmitting the nervous power.

Morbid sensations are among the most common phenomena of diseases. In many affections, indeed, there are peculiar and characteristic modifications of sensibility, which it is of importance to notice in a diagnostic point of view. In strumous disease of the mesentery, an unusual sensibility to cold constitutes a peculiar and very early symptom. "In this disease, the patient is greatly sensible to cold and to the least draught of air, and in cold weather especially, constantly draws near or hangs over the fire, until the hands and legs assume a brown color from the influence of the heat."

Pain may depend on inflammation, on spasm, or on nervous irritation. Each of these kinds of pain has a peculiar character by which it may in general be readily distinguished. *The pain of inflammation* is attended with great tenderness or soreness of the affected part—is increased by pressure—generally continuous, and always attended with more or less of febrile irritation. Spasmodic pain, on the contrary, is intermitting—is neither throbbing nor burning, like that of inflammation, nor is it attended with redness, swelling, augmented heat, or febrile excitement. Pressure, which always increases the pain of inflammation,

generally mitigates spasmodic pains. *Neuralgic* pain differs from inflammatory and spasmodic pain, by occurring in transient and extremely violent paroxysms. It darts with the rapidity of lightning along the ramifications of the affected nerve. It is not attended by swelling or increased heat, unless some degree of inflammation be associated with it; and the slightest agitation or touch is apt to renew its excruciating paroxysms.

It is a fact demonstrated by daily observation, that the character of inflammatory pain is peculiarly modified by the nature of the structure in which the inflammation resides. This circumstance necessarily arises from the physiological fact, that each structure of the animal system is endowed with a peculiar modification of the vital properties. From this variety in the general character of inflammatory pain, according to the structure in which it resides, we frequently obtain important diagnostic indications. In the mucous membranes, inflammation is attended with a burning or stinging pain, and is seldom very violent: in the serous membranes the pain is lancinating, and generally extremely acute; in the fibrous tissues, it is dull, aching and gnawing; in the nerves, rapid, darting, remitting and excruciatingly severe; and in the parenchymatous and cellular structures, it is dull, throbbing and heavy. Thus the pain experienced from inflammation of the pleura, is acute, piercing, and generally extremely severe; whilst that from inflammation of the substance of the lungs, is dull, pressing, and generally inconsiderable in violence. The pain attending inflammation of the mucous membrane of the stomach is of a burning, gnawing, or stinging character; that of the liver is acute, throbbing, and generally accompanied with a sense of fullness and tension in the right hypochondrium and epigastrium. The character of the pain may, moreover, assist us in determining in what portion of this organ the inflammation is principally seated. When the substance of the liver is the principal or exclusive seat of the inflammation, the pain is seldom very acute or violent—being obtuse, heavy, and heating. When the *convex* surface of this organ is affected, the pain is usually extremely severe, darts upwards towards the left or right shoulder, and is always much increased by external pressure, deep inspiration, cough, and motion. In cases where the *concave* surface is the seat of the inflammation, the pain is, in general, dull, accompanied with much anxiety in the epigastrium, nausea, and often vomiting. Cases of this kind frequently resemble gastritis; but may be distinguished from this affection by the pain, distress, and vomiting not being increased by taking warm liquids into the stomach.

In many instances the painful sensation is referred to a different and often remote part from that in which the primary irritation or affection is seated. Irritation in the neck of the bladder frequently gives rise to pain in the glans penis; inflammation of the liver often causes pain in the left, and sometimes right shoulder; and severe and protracted pain in the knee and legs, is generally among the first painful sensations attending hip disease. In many cases, indeed, pain in the knee is felt for a considerable time before any unpleasant sensations are experienced or complained of in the hip; and I have not unfrequently known various applications made to the knees of children for the relief of pain in that part, which was subsequently found to be merely symptomatic of scrofulous disease of the hip. Inattention to these and similar facts has often led to very useless and painful applications, and placed the physician under the mortifying, and, indeed, justifiable imputation of ignorance or culpable carelessness.

The next class of symptoms to be considered, are those manifested by the morbid conditions of the alimentary canal. From the nature and appearance of the alvine evacuations, we may often derive important diagnostic information. The functional derangements of the liver are, in general, readily distinguished by the character of these evacuations. Ash, or clay-colored feces indicate either deficient secretion of bile, or obstruction to its regular flow into the intestines. This condition of the biliary organs is almost always attended with increased irritability of the stomach. When the alvine discharges are liquid, and of a bright *green* color, as is frequently the case in infants, the existence of much acid in

the bowels may be confidently inferred. Bile, as it comes from the liver, never possesses such a color. It is only by being mixed with acid in the intestines, that it acquires this appearance. However dark and vitiated the bile may be before it is discharged into the bowels, it will always communicate a yellow color to water. It becomes green in the intestines by the action of the acid it meets there. According to the observations of Dr. Cheyne, the appearances of the stools afford a good diagnostic sign between infantile remittent fever and hydrocephalus. In the former disease, the alvine discharges are, generally, dark brown or mud-like, and extremely fetid. In hydrocephalus, the stools are usually gelatinous, dark green, sometimes black, like tar, and of a peculiar sickly smell. Watery and reddish stools containing small flakes of mucus, resembling the washings of flesh, always indicate a high degree of inflammatory irritation of the mucous membrane of the small intestines.

The diagnosis of disease is also much aided by an attention to the morbid conditions of the respiratory organs. In general, the greater the velocity and momentum of the blood, the more rapid is the respiration. In acute diseases, attended with a frequent and full pulse, breathing is always accelerated. In affections of the head, attended with sanguineous congestion in the brain, respiration is generally more or less irregular, unequal and suspicious. When the congestion, and consequent cerebral compression, are so great as to produce partial insensibility, the breathing becomes slow, irregular and stertorous. Whatever obstructs the functions of the brain, or interrupts the nervous communication between it and the respiratory apparatus, impedes or destroys the function of respiration: and the slowness and irregularity of the respiratory acts will be in proportion to the degree in which the functions of the brain are oppressed.

In pneumonia, breathing is sometimes performed by the action of the diaphragm alone, without any perceptible elevation and depression of the ribs of the affected side. In abdominal inflammation, with acute pain, on the contrary, respiration is performed almost exclusively by the action of intercostal muscles, the alternate rising and falling of the abdomen, so conspicuous in thoracic inflammation, being almost entirely absent. "This peculiarity of breathing," says Dr. Hall, "may be distinctly observed by looking on the chest and drawing the bed-clothes tight over the abdomen: the respiration has sometimes the appearance of heaving of the chest; every movement of the diaphragm is cautiously avoided on account of the motion which its action communicates to the abdominal viscera. The diaphragm and abdomen begin to move, as the pain diminishes, whether from mitigation of the disease, from sinking, or from gangrene."

In inflammation of the substance of the lungs, or of the mucous membrane of the ultimate bronchial tubes, respiration is performed with great difficulty, and in violent cases with distressing anxiety and labor. "The shoulders are elevated, and the lower part of the sternum is drawn back, during each act of inspiration, whilst the abdomen is at the same time suddenly protruded, and the upper part of the chest raised." In the diseases of children, the manner in which respiration is performed often throws important light on the character of the disease. When, with more or less cough, the inspirations are short and catching, more especially when the countenance, at each inspiration, exhibits an expression of pain or suffering, the existence of pectoral inflammation may be confidently inferred. If the countenance is pale, and the breathing wheezing and laborious, the inflammation is probably seated in the mucous membrane of the bronchia.

Laborious and anxious breathing on muscular exertion or strong mental excitement, particularly from walking up hill, or ascending stairs, is strongly indicative of organic disease of the heart. The dyspnœa of hydrothorax differs from that of organic cardiac disease, in being more liable to recur in violent paroxysms from the causes just mentioned in the latter than in the former affection. In hydrothorax, too, the dyspnœa, thus excited, comes on gradually, whilst in organic disease of the heart the paroxysm of suffocative breathing recurs with sudden violence. Asthma is attended with a peculiar mode of dyspnœa. The act

of inspiration consists of a quick and imperfect dilatation of the thorax, but expiration is much more protracted, labored and wheezing. "When the disease is violent, every muscle subservient to this function is brought into strong exertion, with the exception of the intercostals, which, although excited to strong efforts, are incapable of that degree of action which is necessary for the due expansion of the chest. What, however, particularly characterizes the dyspnœa of asthma, is the *wheezing* during expiration."

When the breathing is hurried, panting, sighing, and the lungs are but partially filled during inspiration, there is probably much debility accompanied by or depending on nervous intestinal irritation. This state of the system and of the respiratory organs is generally attended with great restlessness, jactitation, and inability to sleep.

Having described some of the more remarkable diagnostic phenomena, in relation to *respiration*, it remains for me to consider the diagnostic indications derived from the character and attending circumstances of *coughing*.

With regard to the phenomena of cough, therefore, we may notice the following general diagnostic circumstances:—Patients affected with inflammation of the pleura, lungs, or peritoneum, always *repress* the cough as much as possible, in order to obviate the great increase of pain which free coughing invariably produces in these affections. When, therefore, the patient is observed to make great efforts to stifle or suppress the acts of coughing, the existence of local inflammation may be confidently inferred. The seat of the inflammation will be pointed out by the other accompanying symptoms. The cough attending acute inflammation of the mucous membrane of the bronchia has a much duller sound, and is attended with much more mucous rattling in the chest than that which results from acute inflammation of the pleura. This remark applies particularly to the early period of these affections; for in the advanced stage of the latter malady, the cough is generally as dull and rattling as in bronchitis. Cough depending on gastric or intestinal irritation, is generally attended with a peculiar hollow sound: this kind of cough is frequently met with in children laboring under verminous irritation. The character of the cough will, in general, afford considerable aid in distinguishing phthisis laryngea from phthisis pulmonalis; or that form of consumption which arises from ulceration in the larynx, from true pulmonary consumption. In the former the cough comes on in violent and spasmodic paroxysms, particularly in the morning on rising from bed; whilst in the latter form of the disease, the cough is usually much less sudden and violent in its attacks, and is, besides, destitute of the spasmodic or convulsive character of the former. In the laryngeal variety of the disease, the cough has a deep hollow sound, not unlike that which is produced by verminous irritation of the bowels, whereas, in pulmonary phthisis, it always has a "flattened and lacerating sound." In the former of these maladies, violent fits of coughing are excited by the patients passing from a warm into a cold air, by inhaling smoke or the dust raised by sweeping, or any irritating fumes, and the same effect is frequently produced by swallowing food. In pulmonary phthisis, coughing is very rarely excited by these causes, and when they do produce this effect, the cough is usually slight and of very short duration.

The character and appearance of the matter expectorated afford important diagnostic indications. In *peripneumonia*, the *tenacity* of the matter expectorated is so great, that we may reverse the vessel which contains it, and retain it in this position for some time, without detaching it from its sides. Laennec regards this kind of sputa as pathognomonic of this affection, "since it is the only symptom which is found exclusively in this form of pulmonic inflammation." These sputa are somewhat diaphanous and of slightly yellow or greenish color. In acute bronchitis the expectoration is much less tenacious in its consistence, and is generally quite transparent, resembling the white of eggs. When the fluid expectorated has a dark appearance, like dissolved blood, and possesses a very fetid smell, we may infer that some portion of the diseased lung is in a

gangrenous condition. In *chronic* bronchitis, particularly in those cases which result from pertussis, the matter expectorated often presents a white cream-like appearance, bearing considerable resemblance to the whitish friable matter which is sometimes brought up in small quantities in the latter stage of tubercular phthisis. This white matter, in the latter disease, consists of the softened substance composing the tubercles. Mucous membranes, under a high degree of irritation, often secrete a fluid which bears a strong resemblance to genuine pus; but which, in its composition and properties, is, nevertheless, strictly a mucus. Various tests have been recommended for distinguishing puruloid secretions of this character from genuine pus, and a correct decision on this point is of much importance in forming a satisfactory diagnosis; for when the matter expectorated is found to be pus, there can be no doubt that the structure from which it proceeds is in a state of active inflammation or ulceration. If, on the contrary, it be found to possess the character of mucus, we may infer that neither an active state of inflammation nor ulceration exists in the diseased organ, but only a high degree of irritation, or sub-inflammatory excitement. The specific gravity of pus is considerably greater than that of mucus; the former sinks in water, the latter floats on the surface. This is the usual test, but cannot always be relied on; for although we may safely pronounce the matter expectorated to be *pus* when it sinks quickly to the bottom of the vessel, yet we cannot, with entire assurance, infer that it is mucus when it remains floating on or near the top of the water; for a considerable portion of pus is often so intimately mixed with bronchial mucus, as to give it a nearly uniform appearance, and cause the sputa to swim on the surface. The following tests have been proposed, and I think are entitled to confidence.—The muriate of ammonia coagulates pus; but on mucus no such effect is produced by it. Heat coagulates mucus, but not pus. Water added to the solutions of pus in sulphuric acid, and in a solution of caustic potash separately, produces in each a copious precipitate. Mucus treated in the same way does not exhibit the same effect. Dr. Young mentions the following test: A small portion of pus put between two glasses, will, when held near the eye, and looked through at a distant candle, exhibit an iridescent spectrum, of which the candle is the centre. Mucus does not present this phenomenon.

The morbid conditions of the external surface of the body should always be carefully observed. In examining diseases, particular attention should be paid to the temperature, the color, the state of dryness or moisture, the fullness or constriction, and the roughness or smoothness of the skin. The existence of œdema, or of emaciation, moreover, is an important diagnostic circumstance. A yellowish or icteric hue of the skin, and especially of the tunica albuginea, is a well-known indication of derangement of the biliary organs. In the various forms of disease produced by marsh miasmata, this symptom is rarely absent. This appearance of the skin, says Mr. Hall, must not be confounded with the *sallow* hue which occurs in chlorosis, cancer, and some other organic affections. "Sallowness is not necessarily accompanied by a yellow hue of the albuginea; but the *icteric* appearance of the skin is always associated with a similar tinge of the eyes. When, therefore, the albuginea is free from this yellowish hue, we may infer that the biliary organs are not particularly disordered, however sallow the general surface may be. When a decided icteric or jaundiced hue of the skin is associated with constant and obstinate torpor of the cutaneous exhalents, or dryness of the surface, we may infer that the biliary derangement, upon which these phenomena depend, consists of chronic inflammation and induration of the liver; and this diagnosis may be regarded as still more certain, if, at the same time, the gums have a peculiar and unnatural firmness. A purple or bluish color of the skin, when not the immediate consequence of cold, indicates deficient decarbonization of blood in the lungs. This appearance occurs, in a striking manner, in the Asiatic cholera. When this livid hue is confined to some particular part of the body, it denotes great venous congestion in the part.

Thus a livid color of the face indicates great engorgement of the blood-vessels of the head, and is almost universally connected with, or rather dependent on, obstructed circulation through the lungs, and attended with an imperfect performance of the respiratory functions.

A pale semi-transparent appearance of the surface, particularly of the prolabia and face, occurs after profuse hemorrhage, or from whatever greatly exhausts the system or produces the process of sanguification. This appearance of the skin is always accompanied with great languor and debility, and depends, generally, on a morbid excess of the serous portion of the blood. This state of the system is almost invariably attended with more or less of anasarcous effusion. A pale and cachectic appearance of the face, attended with a leaden hue of the prolabia and *a puffy swelling under the eyes*, is frequently noticed in organic affections of the heart. A cold state of the surface of the body, attended with a sensation of heat in the internal parts, indicates great sanguineous congestions of the viscera. The heat is sometimes very unequally distributed throughout the various parts of the body, and it may be laid down as a general rule, that in whatever part the heat is preternaturally elevated, there is an unusual determination of blood to that part. Thus in hydrocephalus, the head is almost always considerably warmer than in any other part of the body; and in dysentery and peritonitis the abdomen is preternaturally hot to the touch, whilst the extremities in the latter stage of the disease are unusually cool. (Hall.) In organic affections of the heart, the hands, nose and cheeks are very apt to become preternaturally cold, whilst the heat within the rectum and under the tongue is generally considerably higher than natural. (Fare.) A pungent, stinging heat of the surface, or the *calor mordax*, as it is technically called, indicates a high grade of malignity or a tendency to putrescency in fevers. This pungent heat differs very distinctly from the *burning* heat which occurs in synochal or inflammatory fever. By laying the hand on the skin of a patient laboring under inflammatory fever, the sensation of heat is at first very great, but on suffering the hand to remain for a short time, the sensation of heat gradually diminishes, until it seems to the touch but little, if in any degree, above the natural temperature of the body. In typhus gravior, on the contrary, the heat (*calor mordax*) becomes more and more pungent and severe, and the biting or acrid sensation of heat remains in the hand, even after it is removed from the patient's body.

The appearances and character of the urine also often afford valuable diagnostic indications. In inflammatory affections it is generally very red and small in quantity; in nervous diseases, more especially in hysterical affections, this secretion is usually copious and limpid, or but slightly colored. In diseases of the biliary organs, the urine is almost invariably conspicuously tinged with bile. To distinguish urine colored with bilious matter from the highly-colored urine of inflammatory fevers, a small strip of white linen or paper should be immersed in it. If the urine contains bile, the linen or paper will receive a very distinct yellow stain, which will remain when dried. If it be free from bilious matter no such tinge will be communicated. Much has of late years been said concerning the connection between a serous or coagulable condition of the urine (in hydropic affections), and a phlogistic or inflammatory state of the system. Drs. Blackall, Wells, and Ayre have investigated this subject with minute attention. It has been satisfactorily ascertained by these and other pathologists, that in those cases of dropsy which are attended with an obvious phlogistic diathesis, and especially such as arise from the influence of general causes, the urine, with scarcely an exception, contains a large quantity of coagulable serum. The quantity of serum mixed with the urine may, therefore, be regarded as a pretty correct index of the degree of general inflammatory excitement attending the disease. Serous urine may be regarded as a sort of pyrexometer in hydropic affections, which, though not universally to be relied on, is yet sufficiently constant to entitle it to the

attention of the practitioner. I am satisfied, from considerable attention to this subject, that in almost every instance where there is coagulable serum in the urine of dropsical patients, the general condition of the system will be found manifestly phlogistic. The mode of testing the urine, for this purpose, is to expose a portion of it in a spoon to the heat of a lamp. When, in hydropic affections, the urine is high-colored, and on cooling becomes muddy, or deposits a red or reddish sediment, we may infer with great probability that the liver is in a state of organic disease. (Cruikshank.)

OF THE ACUTE DISEASES OF THE SANGUIFEROUS SYSTEM.

I.—GENERAL IRRITATIVE DISEASES OF THE BLOOD-VESSELS INDEPENDENT OF LOCAL INFLAMMATION.

CHAPTER V.

OF INTERMITTING FEVER.

Intermitting fevers occur under the three primary types mentioned in a preceding chapter, and occasionally under the various complications which these types are liable to assume. According to the type which they assume, therefore, they are divided into *quotidians*, *tertians*, *quartans*, *quintans*, *&c.*

The fit or paroxysm of an intermitting fever consists of *three* distinct *periods*, all of which are characterized by a series of *peculiar* phenomena, each succeeding period being the immediate consequence of the one which precedes it.

The symptoms which characterize the *forming* state of an intermittent paroxysm, do not differ from those which usually precede the development of the other forms of fever. A sense of great lassitude, frequently yawning and stretching, a feeling of uncomfortable weariness of the whole body, and slight aching pains in the loins and extremities, constitute the first manifestations of the approach of an intermittent fever.

Cold stage.—After the foregoing symptoms have continued for an indefinite time, the patient begins to experience slight and transient sensations of cold along the back; attended often with an irresistible disposition to yawn and change the position of the extremities; the fingers and feet lose their natural temperature, and feel slightly benumbed; the patient becomes restless, and soon tired of the same position; his ideas pass with unusual rapidity through his mind; he is incapable of fixing his attention upon any particular object, and generally manifests an unusual irritability of mind, or ill temper, or a taciturn moroseness. The sensation of chilliness, with more or less rapidity, extends itself from the extremities over the whole body; the skin becomes universally pale, contracted, and rough; the pulse loses its activity and size, becoming small, contracted, frequent, and firm. When the sense of chilliness has passed from the extremities to the body, a slight trembling of the muscles begins, generally, at first, in the jaws, and extending thence quickly over the whole frame. This trembling is sometimes so severe as to agitate the patient as if he were in a paroxysm of convulsions, and sometimes exhausts him so much as to leave him scarcely able to move his limbs after their subsidence. These tremors are technically called *rigors*. During the chills the sensibility of the surface is benumbed, and the whole body becomes diminished in volume, so that rings which were previously tight drop from the fingers. The feeling of cold is not confined to the surface, but appears in violent

cases to penetrate even to the bones, and to pervade the whole system, " and is accompanied with an indescribable sense of universal pain and fatigue."* The breathing also is hurried, anxious, and oppressed, and frequently attended with a short, dry cough, deep sighing, and a sense of weight and tightness in the chest. Along with these symptoms there occur usually much dejection and confusion of the mind, and in some instances, a slight degree of delirium. In very debilitated persons a violent fit of *rigors* often induces a complete state of stupor or coma, more especially when feebleness of body is attended with general plethora. In many instances, frequent and distressing vomiting occurs, particularly about the period of its subsidence, and the ejections are generally bilious, though occasionally ropy, transparent, and insipid. The thirst is always urgent in this stage, and the mouth and fauces are dry and clammy. The urine is clear, colorless, without sediment, and often copious. Generally, the chills are universally diffused over the body; but in some cases they occur partially, remaining confined to one or more parts of the body; and instances have been recorded in which a single extremity only was affected with the chills. In some cases of intermitting fever, the cold stage is attended with but a very slight sensation of chilliness creeping along the back and over the extremities; and I have known this stage to commence with violent vomiting, and to terminate speedily in stupor and partial insensibility. The duration of the cold stage is very various, ranging from a few minutes to four or five hours. Sooner or later, however, the chills begin to abate; transient flushes of heat pass over the face and body; the chilliness now recedes rapidly, and the heat encroaches *pari passu*, until it has obtained an entire ascendency. At this time the nausea and vomiting are usually most severe—both of which often continue until the hot stage is completely developed.

The hot stage is characterized by a full and flushed countenance; an intensely *hot* and *dry* state of the surface of the body; great thirst and dryness of the mouth; great acuteness of the sensorial powers; a full, strong, and frequent pulse; a more free and regular respiration than in the preceding stage, though still more oppressed and hurried than natural; great pain in the forehead; pain in the back and extremities; sometimes slight delirium just before the commencement of the succeeding stage; a scanty and deep-colored urine without sediment. This stage is as various in its duration in different cases, as the preceding one. It continues, however, almost always much longer than the cold stage. The temperature of the skin is always very considerably augmented. Fordyce observed it as high as 105° of Fahrenheit. This stage terminates in the last, or,

The sweating stage.—When the perspiration begins to appear, an obvious abatement of all the febrile symptoms occurs. The sweat appears at first about the head and breast, and thence gradually extends over the whole surface of the body. On the appearance of this evacuation, the pulse loses its *hardness* and *frequency*, but still retains its *fullness*. The breathing at the same time becomes free and natural; the febrile heat subsides rapidly; and the urine, though still very high-colored, deposits a lateritious or pale red sediment. This gradual melioration of the febrile symptoms continues under the free flow of the perspiration, until the paroxysm terminates in a state of perfect *convalescence* or *apyrexia*.

The apyrexia, or intermission, though entirely free from febrile phenomena, cannot, however, be regarded as a state of health; for, during this interval, the patient usually feels some degree of languor; becomes easily fatigued; complains often of a want of appetite, and an indisposition to bodily or mental exertion. He possesses, moreover, an unusual degree of sensibility to the impressions of cold air; and his countenance exhibits a pale and sickly aspect. In some, though comparatively few instances, the appetite is good, and the patient experiences no feelings of indisposition whatever during the intermission. The more conspicuous the symptoms of imperfect health are, during the intermissions, the more

* Macculloch on Intermittent and Remittent Fever, &c.

difficult, in general, will it be to prevent its recurrence; or, the more readily will it relapse after it has been suspended.

Intermittents of every type are subject to certain prominent modifications in relation to their general character, which, as they have important practical bearings, deserve particular attention. We meet with intermittents, for instance, which are attended with unequivocal manifestations of an *inflammatory character;* others occur in which symptoms of great *internal venous congestions* are equally conspicuous; a third variety of intermittents will exhibit strong symptoms of *biliary and gastric irritation;* and a fourth variety will be characterized by phenomena indicative of a more or less *malignant character.* According to these circumstances, intermittents may be divided into the four following varieties, viz: 1, the *inflammatory;* 2, the *congestive;* 3, the *gastric;* and 4, the *malignant* intermittents.

1. *Inflammatory intermittents* occur most frequently during winter and in spring. Quotidians are more apt to assume this character than tertians; and tertians more apt than quartans (Richter). In young, robust, and plethoric subjects, vernal quotidians are especially prone to manifest inflammatory symptoms. Intermittents of this character generally begin with strong rigors. In the hot stage, the temperature of the surface is very intense, and the pulse is peculiarly strong, hard, and full. The most characteristic marks of inflammatory intermittents occur, however, during the intermission. However profuse the perspiration in the last stage, the apyrexia does not become complete. The pulse remains quick, somewhat tense and accelerated; the thirst is still considerable, and the skin dry and warmer than natural; the whole system is irritable; the temper is fretful or discontented; slight headache is experienced; and transient pains are often felt in the extremities and the back. In many instances a short and dry cough occurs, with some oppression in the chest, or other pectoral affections. Richter observes, that inflammatory intermittents are very rarely attended with symptoms of gastric disturbance from vitiated secretions, bile, &c. The intermissions in agues of this kind are usually short. (Richter.)

2. *Congestive intermittents* occur seldom. They happen generally in persons of exhausted and debilitated habits; and in such as are of an irritable and nervous temperament, connected with habitual or accidental debility. They are characterized by a very protracted cold stage, deep-seated pain in the head, vertigo, fainting, a sense of weight or oppression in the breast, coma, a small and weak pulse; the hot stage coming on very slowly, and developing itself very imperfectly, so that instead of hot skin, flushed countenance, and a full and vigorous pulse, the system continues to be oppressed, the skin scarcely warm, the countenance pale and contracted, the breathing confined and anxious, and the pulse frequent, small and tense, with an internal sensation of heat.

3. *Gastric intermittents* are characterized by prominent symptoms of gastric and intestinal irritation, redundancy of biliary secretion, and other saburral matters lodged in the alimentary canal. The ordinary intermittents of the temperate climates, occurring in Autumn, are usually of this kind. Intermittents of this modification are attended with a foul and bitter tongue; much nausea and bilious vomiting; great pain in the forehead; diarrhœa; an icteric hue of the skin and albuginea; urine loaded with bilious matter; thirst for acid drinks, and sensation of weight or fullness in the right hypochondrium. Intermittents of this kind are apt to produce visceral disorders, more especially indurations of the spleen and liver, and finally, a cachectic condition of the system which is often extremely difficult to remove. (Richter.)

4. *Malignant intermittents* are of frequent occurrence in *hot* climates, and are always of the most dangerous character. They are characterized by a very copious and *fetid* perspiration in the third stage, together with colliquative hemorrhages from various parts of the body, sometimes petechia, and other marks of malignity. They run their course with great rapidity, death usually taking place in the third paroxysm. (Alibert.)

Irregular and anomalous intermittents. Intermittents do not, however, always pursue the regular course that has just been described. In some instances, anomalies of a remarkable character occur, both in relation to the phenomena and the succession of the stages of the disease. I have known a case in which the first two paroxysms occurred in a perfectly regular manner; but after employing arsenic, unsuccessfully, during the second and third intermissions, the paroxysms returned without a cold stage, the patient experiencing, instead of it, a peculiar feeling of numbness on the top of the head, with great dullness of hearing, for about forty or fifty minutes before the supervention of the hot stage. There are instances on record, of the inversion of the natural order of the cold, hot, and sweating stages; several distinct instances of which occurred under my observation in the fall of 1828. Cases have been noticed in which the perspiration, in the third stage, was substituted by diarrhœa; and Cleghorn states, that he saw tertians, which terminated by an increased flow of urine, with scarcely any sweat.

In infants, the paroxysms of intermitting fever are sometimes ushered in by convulsions; but the convulsions are most apt to occur at the commencement of the hot stage. Indeed, the cold stage of very young children is seldom marked by distinct *rigors*. A pale and shrunken countenance, with an obvious reduction of the temperature of the surface, yawning, and stretching, usually manifest the presence of this stage in infants.

There are certain affections, not of unfrequent occurrence, which, from their strict periodicity, as well as from their apparent origination from the same causes that give rise to intermittents, are termed *masked agues, febres intermittentes larvatæ*. Thus, neuralgia, in various parts of the body, sciatica, rheumatism of the eye, hæmicrania, toothache, cramp in the stomach, dysentery, cholera, hiccough, mania, and acute pains in other parts of the body,* have been known to recur in a manner strictly periodical, and to have yielded readily to the same remedies which are found to arrest the course of an ague. These affections, when thus perfectly periodical, generally manifest their alliance to intermitting fever, by being almost always preceded by a very slight sensation of chilliness, and by being attended with a moist skin and a turbid urine at the termination of the paroxysm. (Richter.)

Intermittents are sometimes *complicated* with other affections, such as dysentery, cholera, jaundice, and visceral inflammations. The vernal intermittents are most apt to become complicated with inflammatory affections; and those which occur in Autumn are most frequently combined with disorders of the alimentary canal and nervous system. Paralysis and apoplexy, according to the observations of Dr. Macculloch, are by no means uncommon occurrences in intermitting fever; and they occur, sometimes, as direct consequences of the influence of the miasmata, without any distinct febrile phenomena.

Many of the affections which supervene in intermittents appear to result from the inroads of the fever itself on the constitution: but the majority of these maladies, whether occurring as concomitants, sequelæ, or substitutes of the fever, are, without doubt, direct consequences of the deleterious influence of the remote cause. Dropsy, jaundice, scirrhus, &c., are, probably, usually the result of the general febrile disease. Unquestionably, too, aneurismal enlargements of the heart and large vascular trunks, must be regarded as the consequence of the violent congestion of the blood which occurs in the internal organs during the cold stage. In the same way, apoplexy sometimes occurs in the commencement of intermitting fever; for the blood recoils so powerfully from the external to the internal vessels, in the cold stage of the disease, that those who are, in other respects, predisposed to determinations to the head, are liable to suffer apoplectic oppression of the brain from this cause. Dr. Macculloch warmly opposes the

* Macculloch on Intermittent and Remittent Fever, &c. See, also, Journ. Générale de Méd., No. 291, foot note. Also, Gazette de Santé, No. 17.

opinion, that in apoplexies of this kind there is any particular congestion of blood in the brain. The cases which I have myself seen, however, do not permit me to doubt that they were essentially connected with cerebral pressure from inordinate vascular turgescence. It is not unlikely, however, that those apoplectic symptoms which occur as the immediate consequence of the powerful influence of miasmata on the brain, independent of chills, or torpor of the vessels of the surface, are in no way dependent on cerebral compression from sanguineous congestion.

Paralysis, neuralgia, mania, &c., as well as the above-named affections of the alimentary canal, are, however, almost invariably direct malarious affections; occurring with or without any manifest febrile phenomena; and frequently exhibiting their affinity to intermitting fever, by their paroxysmal and strictly periodical character. For a full exposition of the nature, phenomena, and management of these miasmal diseases, the reader is referred to Dr. Macculloch's Treatise on Intermitting and Remitting Fever.

But if intermitting fever has a tendency to *produce* other affections, it has been found also to *remove* various diseases of a chronic and obstinate character. Celsus observes, that intermitting fever is often remedial of itself; (lib. ii., cap. 8, p. 70.) The tendency of quartans to cure epilepsy, is mentioned by Hippocrates, (*Epidem.* 1;) and we are told that the celebrated mathematician De la Hire was permanently relieved of an habitual and most violent palpitation of the heart, by an attack of ague of the quartan type. (*Academ. des Sciences, l'an.* 1718; *Hist.*, p. 110). Fordyce states, that rheumatism, cutaneous eruptions, hysteria and indigestion, have been effectually removed by attacks of intermitting fever; and Vogel asserts, that he has known asthma and hypochondriasis cured by this disease. Almost all writers, however, attribute much more sanative power in this respect to *quartans* than to either of the other two types.

Intermittents, when suffered to pursue their course without being controlled or embarrassed by external influences, appear to have a natural tendency to terminate spontaneously, after a certain number of paroxysms have been passed through. Quotidians, for instance, if they are simple and regular, will tend to terminate their course on the seventh day, and tertians on the fourteenth. Quartans will generally run on to the sixth week. Of the natural tendency of the two former types to terminate at about the periods just indicated, I have the strongest conviction from my own observations. The disease may not generally terminate spontaneously at these periods, but its tendency to do so will be such, that if assisted by a proper febrifuge, it will not only more certainly be arrested, but a *relapse will scarcely ever occur*, unless the remote cause continues to act on the system. Every one who has had considerable experience in the treatment of intermittents, must have been struck with the great frequency of relapses, even where the patient has been removed out of the sphere of the influence of the remote cause. From what I have observed in relation to this subject, I will venture to say, that if the usual febrifuges were withheld until after the seventh paroxysm, such an occurrence would, under all circumstances, be comparatively very rare. I have already adverted to the tendency of intermitting fevers to relapse at stated intervals; and although I cannot undertake to reconcile the apparent opposition in these statements, namely, that fevers of this kind tend naturally to *terminate* and also to *relapse* at the septenary periods, yet of the truth of the observation I entertain the strongest conviction.

Prognosis.—The intermittents of temperate climates are among the least dangerous of febrile affections. In hot latitudes, however, they often assume a highly malignant and fatal character. Death from a simple and mild intermittent does, nevertheless, sometimes occur; and when this happens, it is nearly always in the *cold* stage, and with symptoms of apoplexy. I have met with two fatal instances of this kind. The violent internal congestions which occur during the cold stage, are well calculated to produce cerebral oppression and apoplexy, particularly in persons who are naturally predisposed to this malady. In general

much less danger is to be apprehended from this disease in the young, robust and vigorous, than in persons of feeble, nervous, and depraved habits of body. In individuals of the latter habit, there is sometimes not sufficient vital energy to react and develop the hot stage, and they occasionally sink into a state of lethargy or fatal apoplexy. The more irregular an intermittent is, in relation to its type and particular phenomena, the more difficult in general it is to effect a permanent cure. Postponing agues are more favorable than such as anticipate their paroxysms. The latter tend to the continued form. A scabby and humid eruption about the mouth and nostrils is a favorable sign. When habitual discharges, whether natural or morbid, reappear after having been suppressed by the ague, perfect convalescence generally soon follows. The state of the digestive functions has an important bearing on the prognosis of intermittents. So long as digestion is performed with considerable activity, and there are no decided marks of gastric irritation, very little difficulty in general will be experienced in removing the disease. But when these functions are prominently deranged, and there are manifestations of much debility of the stomach, we may calculate on meeting with considerable difficulty in our efforts to prevent the return of the paroxysms; for even should a temporary stop be put to the progress of the disease, the liability to relapse in this state of the digestive apparatus, is such as to render the best-directed treatment often abortive.

Delirium seldom occurs in intermittents, and when it does happen, it must be viewed as unfavorable; and even more so than mere coma. In malignant intermittents, delirium is common; indeed, it may be regarded as almost peculiar to the worst varieties of this disease. Difficult and oppressed breathing, attended with hiccough and frequent deep sighing, is a bad sign. Sydenham observes, that a tumid and hard abdomen, with swelling of the tonsils, is in general indicative of a fatal termination. One of the most unfavorable signs is a profuse and prolonged colliquative and offensive diarrhœa. Bloody urine also is very unfavorable. The latter symptoms are almost exclusively confined to the violent intermittents of *hot* climates. When, *during the intermission*, the patient remains very much debilitated and oppressed, and the feet and legs are œdematous, considerable danger may be justly apprehended.

Tertians are, in general, more readily removed than quotidians, and quotidians than quartans. Intermittents not unfrequently change into the remittent form; and this conversion is, of course, always an unfavorable occurrence. When such a change is about to happen, the paroxysms of the intermittents are progressively prolonged until they run into each other. *Simple* tertians always reduplicate their type before they assume the continued or remittent form. The conversion of the intermittents into the remittent form is particularly favored by whatever is capable of causing or augmenting the general phlogistic condition of the system, and especially by the accidental supervention of some internal inflammation. The unseasonable employment of tonics and stimulants is frequently productive of such changes in the form of the fever.

Causes.—The only general cause of intermitting fever is *koino-miasmata*. Intermittents are the simplest, and in general the least dangerous of all the febrile diseases produced by this variety of miasmata. In the vicinity of marshes, we may often trace the various grades of miasmatic fevers from the most violent and fatal to the simplest and mildest varieties, as we progressively remove from the focus of the deleterious exhalations towards the circumference of its influence. On the borders of the soil whence the miasmata emanate, if very copiously engendered, continued and highly fatal cases of bilious fever will prevail; at a greater or less distance from this point, mild remittents will predominate; and at a still more remote situation, intermittents will be most common. From the same circumstances, the first diseases which occur in miasmatic districts are generally intermitting fevers; as the season advances, remittents occur, and finally prevail with great violence; as the cold weather approaches, and the extrication of mias-

mata begins to diminish, intermittents again become more common, and the remitting fevers gradually disappear.

The tendency of *koino-miasmata* to produce intermittents is much enhanced by sudden changes of atmospheric temperature. Intermittents are never more prevalent than when the days are very warm, and the evenings and mornings cool and damp. In some instances, several weeks elapse between the reception or impressions of the miasm and the occurrence of the fever. I have repeatedly known persons to be attacked with intermitting fever in this city several weeks after they had been exposed to *koino-miasmata* in the country.* Persons who have been exposed to miasmata should carefully avoid everything capable of debilitating the system, and particularly the digestive organs, for at least two weeks after exposure.

Although *koino-miasmata* may be regarded as incomparably the most frequent cause of intermitting fever, yet various other causes may, under favorable circumstances, give rise to this form of fever. Richter observes, that the worms and other causes of intestinal irritation have been known to produce intermitting fever. He mentions, also, suppressed catamenia and hemorrhoidal discharge, as well as the drying up of old ulcers, as occasional causes of intermitting fever. I have seen one instance, in a delicate child, where a distinctly formed ague was manifestly produced by intestinal irritation from too free an indulgence in irritating articles of food. An interesting case is related by Mr. Earle,† in which a regular intermittent was produced by the irritation of a small piece of dead bone in an old wound, and which was at once arrested on removing the irritating substance. It would seem that either the generation of miasmata, or their power of producing intermitting and remitting fevers, is greatly controlled by certain occult conditions, wholly unconnected with any appreciable circumstances, with regard to atmospheric temperature, or any of the other known requisites for the production of this poison. In certain districts of the temperate latitudes, malarious fevers will sometimes disappear, or become extremely rare for a number of successive years; and then gradually become more and more common, until, in the course of a few seasons, they assume the prevalence of an epidemic; and yet no material difference will be obvious between these periods of exemptions from and prevalence of disease, in relation to what are deemed the necessary concomitants for the production of miasmata.

Proximate cause.—In relation to the proximate cause of this form of fever and of its periodicity, we may at once confess our entire ignorance; for all that has hitherto been advanced in relation to these mysterious subjects amounts to nothing more, at best, than some ingenious conjectures and hypothetical speculations, with a great deal of crude and absurd reasoning and idle suppositions. As to the sentiments of Broussais, which place the proximate cause of this and all other fevers in an inflammation of the mucous membrane of the alimentary canal, it can neither be profitable nor interesting to repeat again what I have already advanced in refutation of its correctness.

Treatment.—The treatment of intermittents must be considered under two distinct heads; namely, that which is proper during the paroxysm, and that

* Upon this point Dr. Macculloch differs so far as I know from every other writer who has attended to this subject. He maintains that the interval between the application of the miasmata, and the first manifestations of its morbific effects on the system, seldom, if ever, extends beyond twenty-four hours. "I know not," he says, "if physicians have fairly observed that the supervention of intermitting fever may be later than twenty-four hours from the exposure to the cause;" and he asserts that the attack of intermitting, as well as remitting fever, "sometimes instantaneously follows the application of the poison." That the febrific powers of miasmata may be manifested very soon after they are applied, cannot be questioned, but the assertion that the period between the reception of the poison, and its obvious effects, does not probably extend beyond twenty four hours, is undoubtedly contradicted by almost daily experience in our own climates.

† Medico-Chir. Review, January, 1827.

which is to be employed during the intermissions, and upon which the radical cure of the disease depends.

In the ordinary regular intermittents of the temperate latitudes, remedial interference during the paroxysm of the disease is extremely uncommon, and is indeed very generally altogether unnecessary. Nevertheless, where the febrile excitement becomes very violent in the hot stage; or where the system is so enfeebled that dangerous congestions and oppression occur during the cold stage, medicinal aid is not only proper, but sometimes absolutely essential to the safety of the patient. During the cold stage of an intermittent, the patient ought to be kept moderately warm; and as the thirst is generally very urgent, bland and warm drinks should be freely allowed. In general, however, *stimulating* drinks, and the application of much artificial heat, with the view of moderating the distressing sense of cold, are improper; since they very rarely lessen the feeling of chilliness, and tend often considerably to increase the violence of the succeeding *hot* stage. These observations apply to the regular disease, occurring in individuals of sufficient vital energy to develop the hot stage, without any artificial support. When the patient is feeble, nervous or exhausted, it will, generally, be beneficial to aid the vital powers during the cold stage, both by external and internal exciting agents, more especially, by the application of external heat. Without such aid, the cold stage will probably be greatly prolonged, and the system so oppressed by internal congestions as to prevent the regular development of the subsequent stages.

Various means have been adopted for the purpose of curtailing the cold stage; and of these, emetics and opium appear to be the most efficient. An *emetic* administered at the beginning of this stage, will frequently put a speedy termination to its progress; and a full dose of *opium*, taken a short time before the expected occurrence of the chills, will generally have the same good effect. This latter remedy was particularly recommended by Dr. Trotter; and other eminent physicians have given their testimony in its favor. In debilitated and relaxed habits the exhibition of a grain or two of this narcotic, just before the accession of the chills, will generally prove decidedly beneficial. I have frequently resorted to it in cases of this kind, with obvious advantage. In persons of a full and vigorous habit of body, it will rarely do any good, and may readily do mischief by increasing the violence of the reaction and of the determination to the brain, in the hot stage. Compression with the tourniquet, also, was some years ago strongly recommended to the profession, for arresting the cold stage of intermittents, by Dr. Kellie.* I have known it to be employed in four cases, and although the effects of it were by no means equal to those which Dr. Kellie ascribes to it, there was, nevertheless, a manifest impression made on the violence and progress of the chills. Dr. Kellie asserts, that by obstructing the circulation in an upper and in a lower extremity, by means of a tourniquet, we may, in general, stop the cold stage in three minutes; and that if the compression be made immediately previous to the accession of the cold stage, it will be entirely prevented. The limited experience which I have had in relation to this practice, does not confirm this very favorable account of its effects; although *some*, and occasionally perhaps *considerable* advantage may, no doubt, be obtained from it. I should apprehend, however, that in vigorous and plethoric subjects, considerable danger must attend this practice, from the tendency which it must have to favor vascular turgescence of the brain; and thereby dangerous oppression or apoplexy.

Within the last two years, Dr. Mackintosh has published some highly interesting observations on the utility of blood-letting in the *cold* stage of agues, which, though contrary to the sentiments universally entertained concerning the character of this stage of febrile development, and the known tendency of blood-letting, are nevertheless too strongly confirmed, by well attested facts, to justify us in rejecting them, without further experience. "There are few things," says

* Medical Commentaries for the years 1794–97, by Dr. Duncan, of Edinburgh.

a late writer, "more repugnant to the imagination of a medical man than that of venesection in the cold stage of intermittents. Books and lectures all inculcate a diametrically opposite practice. We see the face and the surface of the body pale and cold; the pulse feeble and quick; the teeth chattering; the whole body shivering; and the suffering patient huddling himself up in all the clothes he can find to keep the spark of life from being extinguished! The very idea of abstracting the vital fluid, which seems almost entirely to have vanished, is horrible. But yet, when we come to reflect that the blood has only shifted its place from the circumference to the centre, and that the internal vessels and organs must now be gorged with this fluid, and as it were in a state of suffocation, there is nothing very incongruous in the attempt to relieve the suffering organs by abstracting a portion of blood from the general circulation." Moreover, when we advert to the circumstance that blood-letting has been strongly recommended and successfully employed to remove the internal congestions which occur in *typhus* fevers, where there is generally an actual deficiency or *impairment* of the vital energies, it does not appear so very extraordinary, that the same means should be adequate to restore the equilibrium of the circulation, or to remove the internal congestion in an ague, where the vital powers are not *impaired*, but only *oppressed*. Dr. Mackintosh states, "that he has seen men in the most severe sufferings from the chills, relieved after the abstraction of six, eight, and ten ounces of blood; and he has known three ounces to suffice. The relief, which is the most perfect relief that can be conceived, is so sudden, when a good orifice is made, that it has surprised and delighted every one who has seen this practice." Dr. M. had this practice tried on himself in 1810; and, although bark and other remedies had entirely failed, he found that before twelve ounces of blood had been drawn, "the rigors ceased with all their unpleasant accompaniments," and neither the hot nor the sweating stage ensued. "A pleasant sense of heat succeeded the painful one of cold; and instead of weakness, he was sensible of an acquisition of strength. He afterwards bled many other patients in the cold stage of this malady, and uniformly with the same favorable results. This practice was put in operation in the Royal Ordnance Hospital, of Edinburgh, in the presence of many medical gentlemen, and, must, therefore, be regarded as amply attested."* In a single instance I have drawn blood, in the cold stage of this disease; and in this case, it moderated the violence of the chills and curtailed their duration in a manifest degree. I have not since had a favorable opportunity of repeating this practice, but from the result of this case, and the strong testimony of Dr. Mackintosh, I feel inclined to give it a further trial, whenever an opportunity of doing so shall present itself. It cannot be presumed, however, that this practice is equally well adapted to all cases. Dr. Zabriskie, of New York, states that he found it, in general, decidedly beneficial in persons "of a plethoric, full habit, with strong pulse, and not enfeebled by intemperance or by the fever." In patients enfeebled by intemperance, or the long continuance of the fever, with a small and weak pulse, bleeding in the cold stage sometimes gives rise to alarming symptoms.†

In the *hot* stage, it sometimes becomes necessary to moderate the violence of the febrile excitement, especially when delirium or alarming local determinations take place. Blood-letting is of course the most direct and efficient means for this purpose, and where the indications for antiphlogistic measures are strong, it ought to be promptly employed. In agues of a decidedly phlogistic diathesis, blood-letting during the hot stage will often contribute considerably to the *successful* employment of the bark in the intermission. I have sometimes known the bark promptly efficient in arresting the disease, after a copious blood-letting during the paroxysm, where it had previously failed. In cases attended with a very hot and dry skin, and a full and vigorous pulse, cool, bland and acidulated

* Ed. Med. and Surg. Journ., April, 1827; and Medico-Chir. Rev., July, 1827, p. 186.
† Am. Journ. of Med. Scien., vol. xiii. p. 80.

drinks are both grateful and salutary. A draught of *cold water* while the skin remains dry, will often speedily subduct the febrile heat and predispose to perspiration. It may also be proper, in instances of very high general febrile excitement, to exhibit some of the refrigerant diaphoretics—such as nitre—antimony—the saline effervescing mixture.* As soon, however, as the skin begins to be moist, cold drinks must be withheld. During the last or sweating stage, we may allow *tepid* drinks of a bland character freely.

When the stomach is extremely irritable—giving rise to frequent and violent vomiting, in the cold or hot stage, tepid diluents should be given, until there is reason to think that the bile is discharged. Opium is, perhaps, our best remedy for checking excessive vomiting in this disease. This article does not often aggravate the violence of the reaction, when given in the hot stage, as might be apprehended. Indeed, Dr. Lind zealously advocates the propriety of exhibiting a full dose of opium, soon after the hot stage is developed, as a general practice. He asserts that it takes off the burning heat of the fever, hastens the accession of the sweating stage, and often produces a soft and refreshing sleep, from which the patient awakes free from all complaints, and in full perspiration. He thinks, moreover, that the use of opium in the hot stage tends to obviate dropsy and jaundice. I have given opium in the hot stage to check vomiting, and have always found it to answer this purpose very promptly and completely, without any unpleasant consequences. I cannot, however, think that opium is a proper remedy in the hot stage of ague, unless it be in broken-down constitutions, or in such as are feeble and exhausted by previous injurious influences—or unless it be employed to remove some accidental affection of a distressing or dangerous character. In cases where the reaction of the heart and arteries is incomplete, and where much internal congestion continues to exist through this stage, opium is, without doubt, a valuable remedy. To put a stop to excessive vomiting in this, as well as in other diseases not attended with phlogosis of the mucous membrane of the stomach, I know of no medicine which is more promptly and certainly effectual than a solution of camphor in sulphuric ether, in the proportion of two scruples of the former to an ounce of the latter; of which twenty or thirty drops may be given with about ten grains of calcined magnesia every half hour until the vomiting is arrested. I have rarely found the second dose necessary.

Whatever advantage may result from remedial treatment *during the paroxysm*, universal opinion concurs in regarding the *intermission* as the proper period for the safe and certain *radical* treatment of intermitting fevers. In prescribing for the radical cure of intermittents, it is of no small consequence to attend to the particular character of the disease in relation to the four modifications or *varieties* mentioned above; for each of these requires some peculiar modifications of treatment.

1. *The inflammatory variety*, as has already been stated, is marked by symptoms during the intermission, which indicate an irritated and phlogistic condition of the system, incompatible with the salutary influence of the bark and the other febrifuge remedies of this kind. In this modification of the disease a strictly antiphlogistic treatment must precede the employment of the tonics usually resorted to. The patient must be put on an antiphlogistic regimen; one or two cathartics composed of calomel and jalap—or calomel succeeded in a few hours by an ounce of Epsom or Glauber's salts, will be proper; and where the inflammatory diathesis is very conspicuous, blood-letting, nitre, antimonials, &c., are often indispensable. In cases of this character, blood-letting will, in general, prove most efficient in reducing the phlogistic habit, when it is practiced pretty

‡ The following mixture is an excellent remedy for this purpose:
℞.—Spirit. mindereri ℥iv.
Spirit. nitr. dulc. ℥ii.
Vin. antimon. ℥i.
Syrup limonis, ℥i.—M. Take a tablespoonful every hour.

copiously during the *hot* stage. In cases of vernal intermittents, in which the bark or quinine had failed in consequence of the general irritated and phlogistic condition of the system, I have succeeded perfectly with these febrifuges, after the patient had taken one of the following powders,* every two hours during an intermission, and a small bleeding in the hot stage of the succeeding paroxysm.

In the *congestive* and *malignant* varieties of ague, it will seldom be proper to lose much time in preparing the system for febrifuge tonics. In such cases, the powers of the system must be economized, and tonics early and liberally resorted to. In the *gastric* modification, which is most commonly met with in the temperate latitudes, there exist obvious indications of gastric impurities and disorder—such as nausea; bilious vomiting and purging; foul tongue; loss of appetite; pains in the stomach and bowels; bitter or depraved taste, &c. In intermittents of this character, it will be peculiarly proper to attend to the state of the alimentary canal, before the bark or tonic remedies are resorted to. Mild mercurial purgatives are generally decidedly beneficial. In some instances, it may be necessary to repeat them several times before the bowels are brought to a proper state for the employment of febrifuges. Emetics, too, will often contribute much to the success of the bark or quinine. In intermittents of a well-formed inflammatory character, there are seldom any unequivocal manifestations of gastric impurities, and hence these evacuations are much less useful or important in them than in the variety I have termed gastric.

Among the various articles which have been recommended for the cure of intermittents, the *Peruvian bark*, with its preparations, is unquestionably by far the most important. Within the last ten years, the sulphate of quinine has, in a great measure, taken place of the bark in substance, and in many respects, this preparation possesses important advantages over the crude material. It has indeed been said, that the bark itself will sometimes remove the disease where the quinine has failed; but the converse may be said with equal correctness; for I have in several instances succeeded with the latter, after the former had been used in large doses without success. Mr. Valpés, of Naples, in a recent communication to the French Royal Academy of Medicine, states, as the result of his inquiries, that the *sulphate of quinine* is preferable to the *cinchona*, in intermitting fevers, whilst the latter is preferable in the fevers formerly denominated *putrid*,† and which are produced by idio-miasmata.‡ From my own experience, I have not been led to think that there exists any essential difference in the febrifuge virtues of these two remedies; but as the quinine is much less nauseous, and can be given in sufficient doses in a very small bulk, I should, from these advantages, always prefer it to the bark in substance, unless some idiosyncrasy exist against its influence, which can be ascertained only by experience.

Much difference of opinion has been expressed, both in relation to the period of the disease, and the particular time of the intermission at which the bark may be most effectually administered in this form of fever. It has been contended, that it will generally be much better to suffer several paroxysms to take place, before any attempt is made to arrest their recurrence. Récamier has recently advocated this practice, as both the most effectual and the safest to the future health of the individual. I do not at all doubt the correctness of this mode

* ℞.—Pulv. nitrat. potassæ ʒiss., pulv. doveri. grs. vj., calom. grs. vj. M.—In chart. No. vj. dividend.

† Revue Médicale, Mai, 1828, p. 306.

‡ In March, 1825, the number of lunatics brought to the *Maison d'Aversa* in the kingdom of Naples, was so great that it was found necessary to lodge them in a convent, which was not properly prepared to receive them. The most filthy of these unfortunate beings were put into a small dormitory, which was in a state of extreme filthiness. A fever soon broke out among them, which was at first regarded as a petechial fever, and was treated by antiphlogistics. The disease made a rapid progress, and became unusually fatal. The sulphate of quinine was finally employed, but this appeared rather to aggravate the symptoms than to afford any advantage. At last, the *bark in substance* was given, and immediately resulted in the happiest effects.—*Revue Médicale*, Mai, 1828, p. 306.

of management. Unquestionably, a great majority of our ordinary agues may be immediately arrested, and with perfect safety, by giving the bark, during the first or second intermission; but in this case relapses are much more common than where the disease has been suffered to run on to the fifth or seventh paroxysm. I have found agues arrested after the first or second paroxysm, relapse again and again, until they were suffered to run on to the fifth or seventh day, when a few doses of quinine put a permanent stop to their progress. It has long been my practice, when I have met with relapsing agues, to suffer them to run on through five or seven paroxysms, before any attempt was made to arrest them, and I have invariably found this plan permanently successful. In cases which require preparation, especially in inflammatory intermittents, delay is, of course, essential, before the bark can be employed with propriety. I would not, however, lay it down as a general rule, that the disease should be suffered to run on through five or seven paroxysms; for where the apyrexia is very complete, and the patient experiences no feelings of illness during the intermissions, the bark may almost always be given with complete success, as soon as the bowels are evacuated by a suitable cathartic.* In instances of an opposite character, or such as have shown a tendency to return after a week or two, it will be very difficult to put a final stop to the paroxysms, if the febrifuge be employed during the first or second intermission. A case came under my notice, during the preceding autumn, which had already relapsed four times, and always punctually on the seventh day. After each relapse, the patient took quinine in full doses, which always arrested the disease for the short period mentioned. When he applied to me, I advised him to suffer his disease to go on for some time, without any other medicine than a mild purge every other day. He did so; and on the ninth day, the disease left him spontaneously and permanently.

The foregoing observations apply, of course, to the *regular* intermittents of the temperate latitudes; for in that rapid and fatal variety, which is termed *malignant*, no time should be lost by preparatory measures, but immediate recourse had to large and frequent doses of the bark, as soon as a favorable intermission occurs. The same rule applies to the disease occurring in very feeble, nervous, and exhausted subjects; for unless it be speedily removed, the system may sink under the repeated shocks of the paroxysms.

With regard to the particular period of the intermission at which the bark may be most successfully given to arrest the succeeding paroxysm, a diversity of sentiments have been expressed by writers. Some have advised its employment in large doses immediately after the sweating stage has passed off; whilst others recommend it to be given largely, "as near to the time of the expected paroxysm as the condition of the patient's stomach will allow." (Cullen.) There are others, again, who think it best to exhibit the bark in divided and frequent doses throughout the whole period of the intermission. (Fordyce.) A few years ago, Dr. Ridgway published some cases which go to show that *one large dose* of cinchona given as near as possible to the commencement of the approaching paroxysm, will as certainly avert the paroxysm as when given in repeated doses throughout the intermission.† Since Dr. Ridgway's publication, Dr. Brown, of Boston, has published a small work, in which he adduces testimony of a similar purport.‡ According to Dr. Brown's experience, two or three grains of the quinine taken just as the first symptoms of the approaching paroxysm are experienced, will, when followed up at intervals with a second, third, and sometimes a fourth dose, almost invariably put a stop to the disease. When given just as the cold stage commences, "its influence over the rising symptoms becomes manifest in a few minutes; the pulse becomes more full and distinct; the respiration more easy; the skin acquires its natural temperature; and, in eleven minutes in his own case, not one unpleasant symp-

* ℞.—Pulv. jalap . . . Calomel, āā grs. x.—M.

† London Medical and Physical Journal for April, 1825.

‡ A Treatise on Repelling the Paroxysm of Intermitting Fevers. Boston, 1836.

tom remained." This state, however, generally continues but a short time, and it becomes necessary to repeat the dose, sometimes three and even four times before the paroxysm is subdued. Dr. Ridgway gave an ounce of the bark at once, as soon as the premonitory symptoms of the paroxysm were felt, and always found it to prevent the attack. There can be no doubt that the disease may be speedily arrested in this way; but it may be reasonably questioned, whether it possesses any real advantage over the plan of exhibiting this febrifuge in efficient doses during the *latter period* of the intermission. I have generally prescribed the quinine in two grain doses every hour, commencing about six hours before the beginning of the approaching paroxysm; and I have had no cause to be dissatisfied with the consequences. Indeed, I have reason to apprehend that a large dose of quinine given during the chills, is calculated to produce very disagreeable effects. In two instances, one a delicate married lady, and the other a lad about twelve years old, a most singular and raving species of maniacal affection ensued; *apparently* from taking large doses of this medicine *after the chills had commenced.* In both instances this alarming mental disturbance continued for several hours. I may be wrong in ascribing it to the cause here assigned, but the circumstances strongly favored the suspicion.

Whatever views we may adopt, with regard to the *time* at which it may be best to begin with the bark or quinine, there can be no doubt concerning the propriety of giving *large* doses,* in such a manner as to make a decisive impression on the system in the latter period of the intermission. I am well satisfied that two or three large doses—three grains of the quinine, given two or three hours before the paroxysm, will do more towards averting it than a *larger* quantity exhibited in small doses throughout the whole interval of the apyrexia. In relation to the propriety of employing emetics and cathartics as preparatory measures for the use of the bark, authors express contradictory opinions. Unquestionably, where the signs of gastric impurities are conspicuous, and there exists no urgent necessity from the nature of the case, to arrest the disease promptly, it will be proper to evacuate the alimentary canal previous to the employment of the bark. These evacuations will also be useful in cases where the inflammatory habit is so strong as to prevent a complete apyrexia. Nevertheless, in the ordinary cases of the disease, where there are no signs of a loaded state of the bowels, and the apyrexia is very complete, the bark may be successfully employed without either previous purgation or emesis. Upon the whole, however, I should, in all instances of this disease not attended by malignity or great prostration, prefer one or two mild cathartics, before the bark is taken, for the reasons already mentioned.

The Peruvian bark has been frequently accused of having a tendency to produce visceral indurations and other unpleasant consequences; such as rheumatism, dropsy, &c. This accusation is, however, wholly unfounded. No doubt, indeed, can exist that these and other injurious consequences may be produced by the *injudicious* employment of this remedy. When given, for instance, in agues, attended with strong marks of an inflammatory condition of the system, without proper antiphlogistic preparatory measures, we can readily conceive that the bark would favor the natural tendency of such cases to terminate in these disorders. In this respect, however, the bark does not differ from other tonic and stimulating remedies; for it is not by anything peculiar in the bark that these effects are produced, but simply by the power it possesses, in common with the majority of febrifuge remedies, of favoring the phlogistic diathesis, and the progress of obscure inflammations.

The bark is now generally given by itself. Formerly it was customary to give it in conjunction with various other remedial articles which were thought to

* If the bark in substance be employed, not less than two drachms ought to be administered at each dose. Such doses taken at intervals of an hour, or an hour and a half, within the last five hours of the intermission, will, perhaps, do all that can be effected by bark in this disease.

augment its febrifuge powers. It is extremely doubtful, however, whether any combinations can materially improve its virtues; and unless some particular circumstance be present which may render the use of other remedies proper, or unless the bark by itself produce unpleasant or injurious effects on the alimentary canal, it will probably be best to employ it singly. When it causes much constipation, it may be usefully given as follows:

℞.—Pulv. cinchon. condam. ℥j.
rhei ℥ss.
muriat. ammonia ℥j.—Misce. In chart. No. iv. dividendæ. One to be taken every hour or two.

When the bark purges, it should be given with small portions of Dover's powder, or opium. The former, especially, acts beneficially in such instances, five grains of which may be given at each dose. Alkaline remedies become necessary in cases where there are signs of much acid in the stomach. The subcarbonate of potash is an excellent adjuvant to the bark in cases of this kind. From ten to twenty grains of the alkali may be given with each dose of the bark; and to prevent this from acting on the bowels, which it is apt to do, it is generally necessary to make a triple compound—viz., bark, subcarbonate of potash, and opium, or what is better, *confectio opii*. When the stomach is irritable, the bark will generally be speedily rejected. In this case we may sometimes cause it to be retained by uniting it with some aromatic substance, such as *serpentaria*, or *cloves*, or *nutmeg*, or the *calamus aromaticus*. The *serpentaria* is, perhaps, the best aromatic adjuvant to bark, where the stomach is too weak to retain it singly. I have, however, always found small doses of opium to answer better than any other remedy for this purpose. The addition of powdered black pepper answers extremely well in cases where the vomiting arises simply from gastric *debility*. Where, however, this occurrence depends on a highly *irritated* condition of the mucous membrane, neither this nor any other aromatic can be proper. In this condition, indeed, the bark itself cannot be employed until the gastric irritation is subdued by leeches, blisters, or cupping over the epigastrium.

The employment of the *quinine* is much less apt to produce the inconveniences just mentioned than the bark in substance; but even this preparation will sometimes produce violent purging or vomiting—several very violent instances of which I have encountered in my practice. Formerly it was customary to employ the *decoction*, or the *tincture*, or what is better, both in union with each other, where the bark in substance could not be conveniently administered, or where the stomach rejected it. Since the introduction of the *quinine* into practice, however, this mode of exhibiting the cinchona has been but little employed; nor does it appear probable that any circumstances can occur which may not be as well met with this very convenient and concentrated preparation, as with either the decoction or the tincture of the bark. The most convenient and elegant formula for exhibiting the quinine, is, perhaps, the following:

℞.—Sulphatis quinæ grs. xvj.
Elixr. vitriol gtt. xvj.
Syrup. limonis ℥j.—M. Dose, a teaspoonful every hour or two for an adult.

As this mixture, though a very neat and concentrated one, is sometimes much objected to on account of its bitterness, especially by children, I have generally prescribed it according to the following formula, by which almost all the bitterness is wholly removed:

℞.—Sulphat. quinæ grs. vj.
Elixr. vitriol gtt. x.
Pub. extract. glycyrrh ℥iss.
Aq. fontanæ ℥ij.—M. Dose, a teaspoonful for a child between two and five years of age.

In cases of ague, which, from long continuance, or from some previous malady, are attended with visceral indurations or enlargements, the quinine or bark must be given, either after a gentle mercurial course, or in conjunction with mercurial

remedies. The blue mass will in general answer best for this purpose, as it is mild, and less apt to pass off by the bowels than calomel. In many instances of this kind, the bark will, in fact, fail entirely in putting a stop to the continuance of the disease; and I have known it to do manifest mischief even when given in conjunction with mercury. In such cases, mercury is the appropriate remedy; and, under careful management, will rarely fail to arrest the disease. From three to five grains of the *blue mass*, taken thrice daily, until the gums become slightly affected, will generally suffice to remove the complaint.

Besides *bark* and its *preparations*, a vast variety of other remedies, drawn both from the mineral and vegetable kingdoms, have been employed with success, in the treatment of intermittents. As nearly all of them are, however, confessedly inferior to the cinchona, it will be sufficient here, barely to mention them. The most efficient of these articles are the following, viz. the barks of the *dog-wood* (cornus florida); of the *American tulip poplar* (Liriodendron tulipifera); of the *horse-chestnut* (E. hippocastanum); of different *oaks*; of different species of *willow*; the *Virginia snakeroot*; *colomba*; *gentian*; *quassia*, &c. *Coffee* is highly recommended by Grindel; given in doses of from fifteen to twenty grains every hour, it is said almost invariably to arrest the disease. (Richter.) The black, or cellar *spider's web*, is highly recommended by Dr. Robert Jackson,* as a remedy for intermittents. He is of opinion "that it prevents the recurrence of the intermittent paroxysms more abruptly and more effectually than even bark or arsenic." I have employed this article in six cases; two of these were speedily cured, the others resisted its powers entirely. Shrader speaks of this article as an effectual remedy for agues, in his Dispensatory, published as early as 1644. It certainly possesses very considerable powers in allaying morbid irritability, and in calming the excitement both of body and mind. In my own person, it produces the most delightful state of mental and corporeal tranquillity, far exceeding that which is caused by opium.† It is given in five or six grain doses every three or four hours. The *muriate of ammonia* is favorably mentioned by Richter as a remedy in this disease.‡ He considers it especially useful in agues attended with gastric impurities, or a loaded state of the bowels; and in cases connected with visceral indurations. It should be given in union with quinine or cinchona in substance. I have used it myself, in cases attended with induration and enlargement of the spleen, and with the most favorable effects. The *muriate of ammonia* is, perhaps, the most powerful remedy we possess for resolving indurations, when given in very large doses internally. In Germany, it has of late years been much and very successfully used in enlargements of the prostate gland, and other similar affections. In my own practice, I have had the most satisfactory proofs of its very excellent powers in this respect. I have given it to the extent of three drachms daily. In intermittents, with indurated spleen, it may be given in combination with quinine, in the proportion of twenty grains of the muriate of ammonia to two grains of the latter. The former ought to be continued after the quinine may no longer be necessary—that is, after the paroxysms have been arrested. *Salicia* has recently been much extolled for its excellent febrifuge powers. It is given in doses of from twenty to forty grains. M. Miquel has published an account of its use in this disease, from which it would appear that it is little, if in any degree inferior to the *quinia* in intermittents. It has also been used by Dr. Gerardin with marked success. Other physicians in France and Italy have employed it for the cure of intermittents, with satisfactory results. Dr. Berti, the erudite editor of Burserius's posthumous works, speaks very favorably of its febrifuge virtues.§

Among the mineral preparations, *arsenic* is undoubtedly the most efficient, with the exception, perhaps, of the *sulphate of zinc*. Arsenic was employed in

* London Medical and Physical Journal, vol. xxi.
† Eberle's Therapeutics, vol. ii. p. 121, first edition.
‡ Specielle Thérapie, vol. ii.
§ North Amer. Med. and Surg. Jour., vol. x. p. 192.

this disease near a century ago, by Jacobi;* but it was not till Fowler and Brera published their experience, in relation to its medicinal powers, that it was brought into general notice as a remedy in agues. It is, unquestionably, a very efficient remedy in this disease; but, in individuals of a cachectic habit, or where there is a scorbutic tendency, it is apt to cause dropsical effusions, as well as great debility and symptoms of a general depravation of the system. It appears, moreover, to be improper in phthisical constitutions, and where a strong phlogistic tendency prevails. Of the tendency of arsenic to produce anasarcous effusion, I have had a strong illustration within the present year. I prescribed Fowler's solution to a syphilitic patient, and, although his nodes and nocturnal pains were removed, he became universally anasarcous. Arsenic appears to be best calculated to remove this disease without detrimental consequences, in individuals of a firm and vigorous constitution. The usual mode of prescribing it is in the form of Fowler's solution, or the liquid arseniate of potash. From eight to twelve drops may be given every four or five hours during the intermission. I have generally given it in substance in union with opium, formed into pills in the proportion of one-tenth of the oxide of arsenic, to one-fourth of a grain of opium every three or four hours during the apyrexia. *Biett's arseniate of ammonia* is, I think, decidedly the best arsenical preparation for internal use. Since the publication of the first edition of this work, I have employed this *arseniate* in various affections—particularly in an instance of periodical neuralgia, and in several instances of *herpes*, with peculiar advantage.†

The *sulphate of zinc* is an excellent remedy for the cure of intermittents. I have very rarely failed to arrest the disease as promptly with it as with quinine. Dr. Firth, in a letter to Dr. S. Mitchell, of New York, dated Calcutta, 1805, speaks in the most favorable terms of this article as a remedy in intermittents. He asserts, that while prescribing in the Philadelphia Dispensary, he found it to cure cases in which both the bark and the arsenic had failed;‡ Mr. Brand also observes that, "in the cure of intermittents, the sulphate of zinc is an admirable tonic." He gives the following formula for using it:

℞.—Zinci sulphatis grs. ij.
Aq. cinnamon.
—— destillat. ãã ℥jss.
Tinct. calumbæ ℥j.—M. Fiat mistura. A tablespoonful is to be taken every three or four hours.

I have hitherto usually employed it according to the following formula:

℞.—Sulphat. zinci grs. x.
Pulv. capsici. ann. ℈ij.
Conserv. rosar. q. s.—M. In pil. No. xl. divid. S. One to be taken every two hours during the intermission.

Black pepper, also, is strongly recommended by Dr. L. Frank for the cure of intermittents; and my own experience has afforded me several examples of its usefulness in this way. It is given in doses of from five to ten grains every two or three hours, either alone or in combination with some of the bitter tonics.§

Tartar emetic has recently been successfully employed in intermittents by Recamier, at the *Hotel Dieu*.‖ Out of seven cases, five were quickly cured by

* De Arsenico sale alcalico domiti usu interno salutari.—Acta Acedem. Elet. Mogunt., tom. i. p. 116.

† This preparation is made by dissolving one part of the oxide of arsenic in four parts of nitric acid, with half a pint of muriatic acid. This solution is then to be saturated with carbonate of ammonia. The supernatant fluid must be slowly evaporated until the crystals of the *arseniate* of ammonia are formed. One grain of this salt is to be dissolved in an ounce of distilled water, to which a small portion of the compound tincture of lavender may be added. Of this solution, from thirty drops to one drachm may be given, in divided doses, in the course of twenty-four hours.—*Casper's Charakteristik der Franz. Med*, p. 204.

‡ New York Medical Repository, 1806.

§ Journal Complément. du Diction. des Sciences Méd. N. 22.

‖ Revue Médicale for December, 1826.

tartar emetic given in ptisans, so as to produce both emetic and purgative effects. This article has also been employed externally with complete success in this disease. Dr. Pommer states, that in the winter of 1815, he was frequently disappointed with the use of the cinchona, in the intermittents which occurred in the army of Wurtemburg, encamped on the Loire and Allier. Observing "that the fever generally disappeared on the eruption of pimples or pustules on any part of the body," he was induced to try what an artificial eruption would do towards curing those cases that had resisted the regular treatment. He accordingly directed frictions with the tartar emetic ointment on the epigastrium, and found it successful in every case as soon as the pustules appeared.*

There are few diseases over which the imagination exercises a more powerful controlling influence than intermitting fever. In all countries and ages this malady has been peculiarly favorable to the extravagant pretensions of superstition and imposture. Amulets and the most absurd practices have been always more or less in vogue, among the common people, as means for arresting the progress of this disease; and the reality of a mysterious power in these spells is sufficiently demonstrated to the minds of the vulgar, by the occasional disappearance of the disease under their occult influence.

So intimate and strong, indeed, are the relations which subsist between the physical and moral elements of our nature, that there are few, if any diseases, in which we may not derive important advantages, from calling to our aid the invigorating powers of hope, or dissipating the depressing emotions of sorrow and fear, and diverting the mind from the causes, phenomena, and probable consequences of the disease, to objects of a more pleasing and hope-inspiring character.

Any strong mental emotion occurring shortly before the usual period of the paroxysm will sometimes be sufficient to prevent its accession. It is especially, however, that condition of the mind which constitutes faith, or strong belief—and which the ignorant frequently yield to the most absurd practices, that opposes the strongest and most effectual barrier to the progress of this and other periodical affections. Dr. Macculloch asserts, however, that the curative effects of moral influences of this kind, are almost entirely limited to primary attacks, "or those which have, at least, not relapsed often;" and he adds, that they are very seldom successful except in cases where all the circumstances of the disease are regular.

The periodical affections, mentioned under the head of anomalous or masked agues, often disappear spontaneously after having continued for some time. This is particularly the case with the periodical neuralgic affections arising from the influence of miasmata. In some instances, however, they assume a persistent course, and yield only to proper remedial impressions. In general, the most efficient remedies for the cure of these affections are the same that are most effectual in regular intermittent fevers. A few full doses of quinine are sufficient often to remove periodical hemicrania, tic douloureux, or sciatica, without any other auxiliary remedies.† In some instances of this kind arsenic is peculiarly beneficial. Dr. Macculloch, in reference to the use of bark and arsenic in these affections, observes, "that there are two leading circumstances under which they often disappoint us. This happens when the attacks of the disease are very irregular; and, secondly, when the disorder is of very long standing; while in exact correspondence with intermittents, these two states are very commonly

* Journ. der Praktischen Heilkunde, 1823.

† During each spring of the last three years, I have given immediate relief to a patient suffering from violent periodical headache, (sun pain,) by the following recipe:

℞.—Sulph. morphiæ, gr. i.

——— quinæ grs. xij.—Make two pills. S. Take one in the morning before the pain appears.

No other remedy had any good effect, nor the successful recipe in smaller doses than those mentioned.

A mercurial cathartic was first given.

united." In such irregular forms of miasmal disease, a "single blood-letting will sometimes render the type regular," and this being effected, the tonics just mentioned will frequently prove effectual. The constitutional influence of mercury, also, "will sometimes cause these tonics to be efficacious when they have failed before." (Macculloch.)

The sequela of this form of fever are often both obstinate and dangerous in their consequences. The most common of these morbid consequences of agues are:—œdema of the feet and legs; enlargement and irritation of the liver and spleen; jaundice; dropsy; and a general broken down state of the constitution. Authors mention other sequela of this disease—such as tympanitis, hemicrania, deafness, vertigo, paralysis and epilepsy. The dropsy and jaundice which occasionally supervene after very protracted agues, depend, no doubt, most commonly on the visceral indurations previously produced by the fevers or the miasmata. In nearly all these secondary affections, mercury may be regarded as our principal curative means. A gentle alterative course will often suffice to remove most of these affections—especially the visceral obstructions, and the disorders which depend on them. Four grains of *blue mass*, with two of pulv. ipecacuanha, ought to be taken every night on going to bed, and a dose of salts taken every fourth or fifth day. When the disease is obstinate, and does not show a disposition to yield to this moderate mercurial influence, two or even three pills may be taken daily, until the gums begin to exhibit marks of its influence on the system, when they should be discontinued, and resumed occasionally, so as to keep up a very moderate degree of the mercurial action. Some mild bitter infusion may be taken in moderate doses twice or thrice daily, during the use of the mercury.

I have already mentioned the *muriate* of *ammonia* as a valuable remedy for the removal of visceral indurations. The formula which I have employed with great success in cases of this kind is as follows:

℞.—Muriat. ammoniæ ℥ss.
Pulv. extract. glycyrrh. ℥j.
Tart. antimonii, gr. i.
Aq. fontanæ ℥viij.—M. ft. S. Take a tablespoonful every four hours during the day.

Perhaps the most effectual remedy we possess for the removal of enlargement and induration of the spleen, arising from miasmata or intermitting fever, is *iodine*. I have employed it in one case, of long standing, with decided advantage, after mercury, the muriate of ammonia, antimony, &c., had been unsuccessfully used. From eight to ten drops of the tincture of iodine should be given three times daily, and a mild unirritating and digestible diet enjoined. We may also use the iodine in the form of frictions over the left hypochondrium;* but I apprehend the internal use of it will, in general, prove most effectual.

Tartar emetic, in very small but frequent doses, forms, also, a very useful medicine in cases of this kind—more especially for the removal of that dry and icterode state of the skin, with œdema of the feet, which is so common a consequence of protracted agues. The best mode, perhaps, of administering this article in these affections is to dissolve it in a large quantity of water, or some mild and pleasant ptisan. I have generally directed one grain of *tartar emetic* to be dissolved in about three pints of water, and to be used freely as common drink. By continuing this drink, so as to consume at least a quart in twenty-four hours, for eight or ten days, the skin generally becomes clear; the bowels regular; the cutaneous transpiration natural; and the enlarged spleen, or liver, manifestly diminished in size and hardness.

Relapses are very apt to occur after the paroxysms have been arrested. The

* ℞.—Hydriodat. potassæ ℈ij.
Axungiæ ℥jss.
Liq. potas. caust. gtt. v.—M. Rub in the size of a nutmeg of this ointment three times daily.

circumstances which seem most capable of causing a relapse are: exposure to cold and damp air; errors in diet and drink; the depressing passions, and renewed or continued exposure to the influence of *koino-miasmata*. All these causes ought, therefore, to be carefully avoided after the disease has been arrested, particularly where previous relapses have already occurred in the same case. It is especially important to avoid every thing which is calculated to derange the digestive organs. But nothing, I conceive, is better calculated to obviate relapses than a delay in prescribing febrifuge remedies until the apyrexia is *complete*, and all signs of a general or local inflammatory condition are removed, and the disease has run on at least over the seventh paroxysm in quotidians, and the fourth in tertians. When an ague assumes a chronic character, none of the usual febrifuge tonics will do more than cause a temporary suspension of the paroxysms. In cases of this kind a gentle salivation will usually do more good than any other mode of management we can adopt. Even if the mercurial influence should not put a permanent stop to the progress of the disease, it will be apt at least to render the system more susceptible to the remedial operation of the bark and arsenic, and thus contribute materially to the ultimate removal of the disease.

CHAPTER VI.

REMITTING FEVER.

Bilious Fever; Saburral Fever.—Febris Pituitosa; Febris Gastrica; Febris Intestinalis; Febris Mesenterica.

Between the simple autumnal *remittent* and *intermittent* fevers there exists no essential or radical difference. They are produced by the same cause; and differ from each other only in the grade of violence and duration of the paroxysm. As remittents, however, assume a peculiar character, in relation both to their general phenomena and their course, and demand a treatment correspondingly modified, they are properly made a subject of distinct consideration, although some writers, following a different course, treat of them under the same general head.

Symptoms.—The symptoms which occur in the forming stage of remittents, do not differ from those which usher in the intermittent paroxysm. Languor, drowsiness, a sense of anxiety, aching pains in the back, head and extremities, are the prominent symptoms of its initial stage. Slight chills are, however, often among the very first manifestations of indisposition—at first they alternate with flushes of heat, which latter gradually increase in duration until they predominate wholly, and the febrile reaction is fully developed. When the fever is once completely established, the pains in the head, back, and lower extremities become greatly aggravated. These pains, especially those seated in the back and legs, are sometimes so severe as to resemble in violence those which occur in acute rheumatism. The eyes soon acquire an icterode or yellowish tinge; the tongue becomes covered with a brownish fur; nausea, and occasionally bilious vomiting occur; a sense of fullness and weight or tension is felt in the right hypochondrium and epigastric regions; respiration is more or less oppressed and anxious; the urine is scanty and deeply tinged with bile; the pulse is full, frequent, but seldom very hard or tense, and the skin is generally dry and hot. These symptoms continue until the succeeding morning, when a gentle perspiration appears on the superior portions of the body, and sometimes over the whole surface. The febrile excitement now abates, frequently, very considerably; but not so as to

amount to a state of apyrexia—the skin still remaining preternaturally warm, and the pulse irritated. This remission continues but a short time—not more, commonly, than from one to two hours. The febrile excitement rises again with more or less celerity, until it acquires its former violence, or perhaps exceeds it; which, after a certain period, again abates, and gives place to another *remission*. In this way the fever proceeds, undergoing regular revolutions of exacerbations and remissions, until it either finally terminates in a perfect crisis and convalescence, or assumes a more uniform or continued course. This description answers for the simple and usual form of the disease as it occurs in the autumnal months of the temperate latitudes; or, for the milder remittents of the warmer climates. There is, however, no form of fever which is subject to so great a diversity, in relation to its grade of violence, as the present one. In the intertropical regions it usually assumes the most fatal and violent character; and at almost every place where it is endemical, it is attended with circumstances which give it a somewhat peculiar character. It is, indeed, impossible to give any description of this disease which can have more than a very general application. We must content ourselves with a delineation of the prominent and characteristic outlines of its physiognomy, (if I may be allowed the expression,) and with a detail of those phenomena and circumstances which may be deemed essential, and which have a particular bearing upon its remedial management.

The ordinary mild remittents of this climate generally assume the double tertian or quotidian type; but the former type is by far the most common; for, although the exacerbations occur once every day, yet we almost always find a very manifest aggravation of all the symptoms on the odd or alternate days. The exacerbations of a remittent of the quotidian type generally occur several hours earlier than those of the double tertian type—the former happening usually about nine or ten o'clock, and the latter not till towards noon, or an hour or two later.

The remissions which so generally occur in the violence of the symptoms of this form of miasmal disease, are not, however, always so considerable as to be readily perceived, either by the patient or the physician; and, in some instances of an aggravated character, they may be, for a time, altogether inconspicuous or absent. It must be observed, moreover, that they do not invariably occur in the morning or forenoon; on the contrary, instances are met with where the remissions take place in the evening, or at some period during the night.

Remittents, although mild and regular in their commencement, are apt to assume an aggravated and dangerous character, if they continue unchecked beyond the ninth day, or second week. When this happens, the tongue becomes more and more loaded with a brown fur, and dry along the middle; delirium occurs more frequently and strongly; the skin acquires a deeper tinge of yellow, and a greater intensity of heat during the exacerbation; debility becomes more and more conspicuous, and the bowels distended with flatus, and tender to external pressure; and, finally, in many cases, watery and offensive discharge from the bowels, retention of urine, continued vigilance, restlessness, and almost constant delirium.

In the paludal districts of hot climates, remittents rarely occur in the mild and simple form which they are wont to assume in the temperate latitudes. They generally acquire a highly aggravated and dangerous character; and under circumstances particularly favorable to their occurrence, they are apt to assume a high degree of malignity from their very commencement. Remittents of this violent grade generally make their attack suddenly, and with great impetuosity. The cold stage is short, and not often very severe. The febrile heat soon predominates, and rises rapidly to a state of great intensity, and is attended with tormenting thirst, violent headache, excruciating pains in the loins and the inferior extremities, great anxiety of feeling and difficulty of breathing, with nausea, and a distressing sense of weight and fullness in the stomach. These symptoms continue for about twenty-four hours, when a remission, always very

considerable, and frequently amounting almost to a perfect *intermission*, takes place. This calm, however, is but transient. A second paroxysm soon ensues, more violent and alarming than the first. The eyes now become yellow, watery, and red; the oppression and anxiety in the epigastrium are extremely distressing, and a deadly sickness, with constant vomiting or retching, torments the patient. After the lapse of some time these violent symptoms again abate, and a clammy perspiration appears on the surface of the body. During the first two paroxysms the bowels are generally torpid. In this way the paroxysms continue to recur, until either a salutary crisis, or death, takes place, one or the other of which not unfrequently happens in the third paroxysm. If the disease runs on beyond the fifth or sixth paroxysm, very great prostration ensues; the remissions become less distinct, delirium almost constantly attends, and the skin acquires either that peculiar stinging heat called *calor mordax*, or becomes cool and cadaverous to the touch. The pulse, in cases of this kind, frequently differs but little from its natural state; more commonly, however, it becomes quick, irregular, and frequent. In this aggravated and protracted state of the disease, various other symptoms usually occur, in addition to those already mentioned, indicative of the fatal malignity of the malady. The lips become swollen, and of a livid or purple hue; the tongue, dark-brown or black—fetid and clammy; the eyes red and watery, or quite dry; the urine, dark-brown, offensive, or entirely suppressed; the alvine discharges reddish and watery, or black, bloody or colliquative, attended generally with a tympanitic state of the abdomen; and petechia and hemorrhages occasionally occur in the last stage of the disease.

In general, the violence of the disease will be in proportion to the suddenness and vehemence of the incursion. When the attack approaches gradually, with the ordinary premonitory symptoms mentioned above, the disease usually runs its course slowly. When, on the contrary, the invasion is sudden and violent, we may expect the disease to be rapid and violent in its progress. The *first* paroxysm only is usually ushered in by a very distinct cold stage—the succeeding exacerbations being rarely preceded by a sense of chilliness.

Between the mildest variety of the disease, and the rapid, vehement and fatal variety just described, this form of fever appears under the greatest diversity of grades and general character. Remitting, like all other forms of general fever, is liable to become complicated, either at an early or late period of its course, with local inflammation; and these secondary local affections constitute the chief and most important cause of those remarkable diversities which are known to occur in this disease, in different localities, or at the same place in different seasons. From some inexplicable circumstance, connected, apparently, with the peculiar concentration or character of the miasmata, we find that, in certain localities and seasons, the disease manifests a peculiar tendency to fall, with especial violence, on some one organ or structure, as the brain, the liver, the alimentary canal, or the blood-vessels, and to assume, in consequence, a peculiar character in relation to its general phenomena and degree of fatality.

In general, however, two important organs—the *liver* and the *alimentary canal*, are the parts most *apt to become* prominently affected in fevers of this kind. In relation to these affections, two distinct modifications of the disease occur; one, in which the phenomena of *gastro-enteritic* disorder are especially prominent; and another modification, in which predominant *hepatic* derangement impresses its peculiar stamp or character on the disease. To the former, the term *gastric*, and to the latter that of *hepatic*, might, not unaptly, be applied.

The remittents of the former variety, namely, *gastric* remittents, are characterized by the following phenomena, viz: redundancy of vitiated bile in the stomach and bowels; a bitter taste; a thick yellowish layer of mucus on the tongue, becoming dry, cracked, and of a dark brown or black color in the progress of the disease; total loss of appetite, and sometimes extreme disgust for every kind of food; a turbid, yellowish, or jumentose urine; great weight and anxiety in the præcordia; bowels tender on external pressure, and distended with

flatus; great pain in the loins and knees; intense pain in the forehead; very distinct remissions; a red or fiery edge and tip of the tongue: or after the brown and black crust scales off, a smooth, shining, and red surface of the tongue; watery and reddish stools resembling the washings of flesh; retention of the urine; difficulty of swallowing liquids in the advanced stage; great craving for cool and acidulated drinks, &c.

Those remittents which manifest predominant *hepatic* disorder, that is, *hepatic* remittents, are characterized by intense febrile heat; violent pains in the head, and early delirium; fullness and tension in the right hypochondrium, with pain and pulsation in the epigastrium and right hypochondrium; a *clean* tongue, at first; excessive irritability of the stomach; frequent and forcible vomiting, *without the ejection of any bile, the matter brought up consisting of a glairy fluid*, mixed with the drinks that may have been received into the stomach; great torpor of the bowels; a very yellow tinge of the skin, and tunica albuginea; and *towards the determination* of the disease, a *copious* discharge from the bowels of a dark or pitch-like matter. In this variety of the disease, the liver is manifestly inactive, and in a state of great sanguineous congestion. That this is the case, may be inferred from the absence of *bile* in the ejections from the stomach; the clean tongue; the sense of weight, fullness and pulsation in the right hypochondrium; the great torpor of the bowels; the intensely yellow color of the skin; and *the excessive and continued retching and vomiting*. This latter symptom namely, extreme *irritability of the stomach*, may be regarded as a strong manifestation of *sanguineous engorgement* and *functional inactivity of the liver*. We find this pathological fact exemplified in *cholera*, particularly in cholera infantum, in which disease there is seldom any bile whatever discharged during its early period; and the appearance of this secretion in the discharges may be hailed as a very favorable occurrence. Towards the conclusion of this variety of remittent fever, the liver frequently recovers its action and relieves itself by pouring a large quantity of black bile, or perhaps blood, into the bowels, as is manifested by the copious dark-colored or tar-like alvine discharges which usually occur in such cases.—These large and very peculiar discharges may, indeed, be regarded as the favorable *crises* of such fevers; for convalescence generally soon follows their appearance; and except the disease be arrested by remedial treatment in the early period of its course, there are but few recoveries in which such discharges do not occur. Dr. Cartwright describes an epidemic fever which prevailed in Monroe county, Mississippi, in the autumn of 1822, which was strikingly marked by the characteristic phenomena of this variety of fever.—"The disease," he says, "was generally ushered in by a distinct chill, which was speedily followed by intense heat, thirst and headache, and very severe pains in the loins. The anxiety and difficulty of breathing, the deadly sickness, sense of weight, heaviness, and pain in the stomach, increased as the fever approached its acme, until the suffering became intolerable. The exacerbations generally occurred in the evening, and a considerable remission, amounting in some cases to a perfect intermission, took place on the ensuing morning. On the evening of the second day a sudden and unexpected paroxysm, more violent than the first one, came on, which was attended with a most horrid sensation of pain and oppression of the stomach, accompanied with deadly sickness and continued vomiting, *but with the ejection of very little fluid of any kind*. The bowels, during the first and second paroxysms, were always in a state of obstinate constipation. About noon of the third day the third paroxysm generally came on. During this paroxysm the skin usually felt rather cooler than natural, and the pulse was commonly remarkably slow. By placing the hand on the abdomen, a pulsation was felt equal to that which the heart produces in the thorax, and synchronous with the pulsations of that organ." During the first two paroxysms the tongue was but little furred; but in the third it assumed a much worse appearance, having a dark red line running from its extremity over its dorsum, which soon changed to a black color. The skin began to acquire a yellow color during the

third paroxysm. The paroxysms continued to recur until the fifth, seventh, or ninth day, when either death took place, or "enormous dark colored evacuations from the bowels occurred, and the patient commenced to convalesce."*

Although the symptoms just mentioned clearly indicate very prominent disorder of the liver, it is equally evident, that in these cases, the mucous membrane of the stomach and bowels is always, perhaps, in a state of considerable irritation, and probably often of inflammation. Nevertheless, it can scarcely be doubted that the peculiar phenomena of this variety of the disease, and which distinguish it from other modifications of remitting fever, depend mainly on certain morbid conditions of the biliary organs, and which do not occur to the same extent in other varieties of the disease. More or less derangement of the biliary system appears, indeed, to be a universal attendant on remitting fever. The tendency of miasmata to act upon and disorder the liver, has already been particularly mentioned; and it may be presumed, from this circumstance, independent of the phenomena of the disease, that prominent functional disorder of the liver constitutes one of the most constant local affections of remitting fever.

Before I leave this part of the present subject, it may be useful to advert again to the former or *gastric* modifications of this disease, and to direct the attention of the reader more particularly to the great tendency there exists in remittents, when they are prolonged in their course, to the occurrence of a high grade of irritation or subacute inflammation of the mucous membrane of the intestinal canal. In most cases of protracted remittents, even of the mildest kinds, the abdomen becomes somewhat tympanitic, and tender to external pressure; and the character of the stools, which are often found to resemble the washings of flesh, are a further evidence of such a condition of the bowels. In a practical point of view, it is of the utmost consequence to be aware of this circumstance: for in many instances this secondary inflammation is excited by the too frequent employment of irritating purgatives, and the disease greatly aggravated and protracted by such a course of treatment.

In localities where miasmata are copiously generated, or possess great virulency, remitting fever sometimes comes on under symptoms of cerebral disorder, simulating apoplexy or mental derangement.—In Italy, and the intertropical countries, the disease not unfrequently makes its attack under one or the other of these cerebral affections. Sudden and furious mania is sometimes among the first manifestations of the disease; and many patients sink at once into a state of insensibility and apoplectic oppression, from the vehement action of the miasmata on the brain. The brain, however, is not so apt to suffer inflammation in this form of fever, as in those which are the product of *idio-miasmata*, contagion, or atmospheric vicissitudes.—This at least, may be affirmed of the ordinary remittents of the middle latitudes; and it is probably generally correct in reference to all malarious fevers. Nevertheless, when the mucous membrane of the alimentary canal becomes inflamed, the brain usually manifests strong sympathetic irritation, by more or less violent delirium of nearly uninterrupted continuance. It is perhaps on this account, namely, the comparative infrequency of cerebral inflammation in remittents, that we do not so often observe that sudden and remarkable collapse of the vital energies in this disease, as in the fevers produced by other causes.

The ordinary remittents of the temperate latitudes often terminate in intermitting fever before the final disappearance of the disease; and it is not uncommon for the milder varieties of the disease to assume the intermittent form at an early period of their course. This conversion of form appears to be particularly favored by blood-letting practised during the first few days of the fever. Remittents, also, frequently terminate in other affections, such as neuralgia; chorea; paralysis; mental weakness; organic disorder of the liver an dspleen; dropsy; pain and swelling of the large joints, &c.

* Medical Recorder, vol. vi.

Causes.—After what has been already said under the heads of *koino-miasmata* and intermitting fever, in relation to this subject, it will be sufficient to observe, that besides *koino-miasmata*, which are unquestionably the sole epidemic source of this form of fever, there are a variety of other causes capable of producing this malady. Worms and other irritating substances lodged in the bowels, may give rise to a regularly remitting form of fever. The disease known under the term of "infantile remittent," appears to arise from intestinal irritation. In the remitting fevers produced by causes of this kind, however, the biliary organs are much less apt to become implicated than they almost invariably are in the miasmatic remittents. Whatever may be the remote cause of remitting fever, however, it seems very evident that the principal morbid irritation is always located in the abdominal organs, and more especially in the liver and mucous membrane of the alimentary canal. So unequivocal and universal is this gastric disorder or irritation, that some eminent physicians have, in consequence of it, designated the disease by the name of *gastric fever*. (Richter.)

Indeed, this term appears to me preferable to that of *remittent*, which has no reference to the pathological condition of the system, and might, with equal propriety, be applied to hectic fever, which, though very distinct from remitting fever, has remissions and exacerbations almost as conspicuous and regular as that disease.

Treatment.—The principal indications to be fulfilled in the treatment of remitting fever are: 1, to moderate the febrile reaction of the arterial system; 2, to remove out of the alimentary canal the vitiated and irritating secretions which may be lodged in it; and 3, to obviate gastro-intestinal irritation, and restore the healthy functions of the liver, and alimentary tube. I shall speak in the first place of the treatment proper in the milder or gastric variety of the disease.

With regard to the first of these indications, very discrepant sentiments have been expressed as to the particular means best calculated for its fulfilment. Some recommend a prompt and free employment of the lancet as decidedly beneficial in the treatment of remittents, whilst others admit its *occasional* utility, and others, again, represent it as frequently injurious, and rarely beneficial. In the ordinary autumnal intermittents of this climate, blood-letting, I am well satisfied, may be often, very properly, entirely omitted. The pulse, in the milder cases of this disease, particularly where the intestinal canal is loaded with bilious and other saburral matter, is not often sufficiently hard and tense to warrant copious or repeated abstractions of blood. In such cases, when unaccompanied by symptoms of strong local congestions or visceral inflammation, I have not found it necessary to draw blood. There can be no doubt, however, that in particular localities, and under peculiar circumstances of atmospheric constitution and vicissitudes, remitting fever may sometimes assume a character which demands the free use of the lancet. To condemn the use of the lancet universally would be as erroneous as to enjoin its invariable employment. Bleeding cannot be employed or withheld, merely on the ground that we are prescribing for a *particular* disease. In all maladies, the state of the pulse must be our main guide, in relation to the use of the lancet. When the pulse is either *hard* or *tense*, whether it be full or contracted, blood may be safely, advantageously drawn, whatever may be the name, or the general character of the disease.

In cases that are attended with violent pains in the head—a full, vigorous, and hard pulse, with a very hot and dry skin, bleeding is, unquestionably, decidedly indicated, and ought not to be neglected. Having moderated the momentum of the circulation by venesection, where this measure is indicated, the attention should next be directed to the alimentary canal. Considerable discrepancy of opinion has been expressed, in relation to the employment of *emetics* in the treatment of remitting fever. In the ordinary autumnal remittents of the temperate climates, gentle emetics will often afford some advantage; but their usefulness is, probably, much too highly estimated by the majority of those who are in the habit of employing them in this disease. I have of late years but rarely

resorted to them in this form of fever, and I am inclined to think, that they may be generally well dispensed with, without losing any peculiar remedial advantages. There exists a decided tendency to gastro-intestinal irritation in every modification of this disease; and, although the operation of an emetic may procure temporary benefit, yet some risk will be incurred of its exciting a degree of permanent irritation, which will subsequently exercise a most pernicious influence upon the phenomena and progress of the disease. In the year 1822, I attended a considerable number of patients laboring under the milder form of remitting fever. During the early part of the season, I prescribed an emetic in the majority of cases that came under my care. In many of these cases, a great degree of gastric irritability continued to prevail during the first period of the malady, and in the advanced stages, much tenderness and tympanitic tumefaction of the abdomen supervened. The disease, in these instances, was wont to run a tedious course—the abdomen became sore to pressure, and the alvine discharges often became watery, reddish, and painful—in short, unequivocal manifestations of high irritations or phlogosis of the intestinal mucous membrane often supervened. Towards the middle period of the season I left off employing emetics entirely; and with the exception of one or two brisk cathartics, in the commencement, confined myself to the use of the milder laxatives, to keep up the requisite discharges from the bowels. From this time on, I met with but few cases in which the former unfavorable symptoms occurred. It must be confessed, however, that there are very respectable authorities to be adduced in favor of the use of *emetics*, not only in the *mild*, but even in the more *rapid* and *violent* varieties of this form of fever. Whatever doubts may be entertained in relation to the usefulness of emetics in the ordinary forms of remitting fever, the weight of good testimony is decidedly against their employment in those violent grades of the disease which occur in *hot* climates, and in which there exists, generally, the utmost degree of gastric irritability. That emetics may *sometimes* be administered without detriment, and even with benefit in these vehement and dangerous varieties of the disease, may be admitted; but it is most obvious, that no small degree of danger must be incurred from the impressions of such a remedy upon the delicate and already irritated or highly irritable mucous membrane of the stomach. The foregoing observations apply with still greater propriety to the employment of what are termed *emeto-cathartics*. Chisholm speaks favorably of their employment; but there have been, comparatively, few practitioners who appear to have found them beneficial. I do not doubt that, in the milder cases, the conjoined operation of an emetic and a purge, will occasionally make a favorable impression on the disease; but I am equally satisfied, that much injury may result from the irritation which they are calculated to produce. In relation to this subject, Dr. Heustis, of Alabama, whose opinions are entitled to much respect, makes the following observations. "As far as my observation extends, I think I am warranted in saying that tartar emetic can never be prudently exhibited in the high and malignant grades of bilious fever. I am confirmed in this opinion from having seen and known so many instances of alarming, and sometimes fatal prostration produced by its exhibition; I have known a person in a high fever, with a strong and full pulse, and generally increased temperature of the body, in less than two hours after taking this poisonous medicine, to be affected with a death-like coldness; the pulse at the wrist no longer perceptible, the eye inanimate, the lips, cheeks and extremities exhibiting the lividity of death, a cold and copious sweat exuding from the general surface of the body, and every symptom of approaching dissolution. Frequent occurrences of this nature have, for the last two years, almost entirely banished the use of tartar emetic from my practice; nor do I ever exhibit it except in the intermitting form of fever, or mild cases of remittents, and even in these instances experience has proved that its exhibition is unsafe, except in the recess or remission of the fever."*

* The Amer. Journ. of the Med. Sciences, vol. ii. p. 40.

Whatever may be thought of the propriety of administering *emetics* or *emeto-cathartics* in this disease, almost universal experience speaks decidedly in favor of the employment of purgatives, not only in the beginning, but at proper intervals throughout the whole course of the disease. In all instances where the irritability of the stomach does not forbid the administration of a purge, the bowels should be early and thoroughly evacuated by a suitable purgative. A combination of calomel and jalap, in the proportion of ten grains of each, will, in general, suffice to procure adequate evacuations. Having emptied the bowels well, by a brisk cathartic in the onset of the disease, recourse must next be had to such remedies as are calculated to restore the healthy functions of the liver, alimentary canal, and skin, and to moderate the general febrile excitement, and obviate or remove the local congestions or inflammations that may supervene.

To correct the morbid condition of the liver, skin, and alimentary canal, constitutes the chief part of the treatment of this malady. For this purpose, the following combination will often answer extremely well:

℞.—Pulv. nitrat. potassæ ʒj.
—— ipecac.
Calomel āā gr. xii.—M. ft Divide into six equal parts.

One of these powders is to be taken every two or three hours. The substitution of the ipecacuanha for the usual ingredient, *tartar emetic*, will obviate the tendency of this mixture to irritate the bowels, and to cause frequent and griping watery stools—which rarely fail to aggravate the violence of the disease. Calomel is a most important remedy in this form of fever. Its power of altering the morbid condition of the liver, and of the whole capillary system, together with its gentle aperient effects on the bowels, renders it peculiarly calculated to do good in this disease. To obtain these important advantages, the calomel should be early and regularly administered, and continued until slight manifestations of its specific influence on the system may be noticed in the gums. When this occurs, its use must be suspended. For more than fifteen years I have employed this remedy in nearly every case of remitting fever which has come under my management, where I have been called to the patient during the first two or three days of the disease. In a great majority of these cases, I found all the symptoms of the disease to abate, often very considerably, as soon as the mercurial influence became conspicuous; and in many instances a speedy convalescence ensued. Although a very gentle mercurial impression is generally decidedly beneficial in this malady, yet strong mercurialization, or ptyalism, appears to be generally detrimental—at least in the ordinary remittents of this climate. It is to be observed, moreover, that in the advanced periods of the disease, the constitutional operation of mercury will be much more apt to prove injurious than beneficial. In general the salutary influence of mercury is restricted to the first five or six days of the disease; and the earlier its general operation can be procured, the more certainly will it prove advantageous.

When the above combination of calomel, nitre, and ipecacuanha excites active purging, as has sometimes been the case, we may not only lose the specific influence of the mercurial, but there is danger of superinducing inordinate irritation in the mucous membrane of the intestinal tube. Whenever frequent, painful and watery stools follow the exhibition of the above combination, the nitre ought to be left out, and ipecacuanha or small doses of Dover's powders added to the calomel. Throughout the whole course of this disease, a gentle and regular action of the bowels ought to be carefully promoted by mild laxatives; but, excepting in the very commencement, strong and irritating cathartics, especially when frequently administered, are often prejudicial. There is no class of remedies which is more indispensable in the treatment of remitting fevers than laxatives; and yet there are no medicinal agents which are so frequently abused, or improperly employed in this disease, as this very class of evacuants. Violent and irritating cathartics, when repeatedly administered in this form of fever, sel-

dom fail to induce a state of irritation in the mucous membrane of the bowels, from which a train of distressing and dangerous consequences arise in the advanced stages of the malady, which are often of more serious import than the original disease itself. The thin, watery, muddy, reddish and fetid stools—the tympanitic and tender state of the abdomen—and the cerebral irritation, which frequently occur in the latter period of the disease, are very often the results of the frequent use of active and irritating cathartics in its treatment. "There is one fault which a physician sometimes commits in the treatment of bilious remittent fevers, and that, too, for the most part, when he thinks he is doing right. I allude to the too long continuation of purgative medicines. He is apt to think that the impurities have been long fixed in the bowels, and, in order to cleanse his patient thoroughly, and to leave nothing noxious behind, he persists in the use of purgatives. What is worse, every appearance of these cases would seem to justify his suspicion of the existence of fixed impurities of long standing in the bowels, and confirms him in his design of at once, and for all, making a clean house. The longer he continues to give his purgatives, the fouler does the tongue become, and the more distressed the stomach; the symptoms, in short, of intestinal impurities become more and more conspicuous, whilst he continues to dilute and to evacuate, without reflecting or knowing that he is himself the cause of all the noxious matter in the intestines, by constantly irritating them with his purgatives, and keeping up an afflux of fluids to the internal or villous coat. The most healthy individual will get a foul tongue and lose his appetite, if he take neutral purgative salts for several days in succession."*

Although *frequent* and *harsh* purgation is generally decidedly detrimental in the treatment of this form of fever, yet the total *proscription* of *laxatives* from the list of remedial agents suitable for its cure, is no less calculated to favor injurious consequences. There is always an abundance of vitiated bile and other morbid secretions poured into the bowels in this disease; and the generation of acrid and irritating materials by putrefactive and fermentative decomposition in the bowels, soon adds greatly to these sources of intestinal irritation, if the bowels be not, from time to time, gently evacuated by laxatives. Mere purgative enemata and bland diluents are wholly inadequate to remove these permanent irritants from the bowels, or blunt their activity. The irritation which such intestinal impurities create, must be vastly more intense and protracted than the trifling and transient irritation of a laxative administered for their expulsion. In the commencement of the fever we may employ one or two active purges, viz:

℞.—P. Jalap. Calomel ãã grs. xii.

Or,

℞.—Extract. colocynth. comp. grs. xii.
Calomel grs. x.—M. Divide into four pills, to be taken at one dose.

Or,

℞.—Calomel . . . . grs. x. To be followed with one ounce of sulphate of soda, in three hours after the calomel is taken.

After the *first*, or, at most, the *second* thorough purgation, the mildest laxatives, assisted with acidulated diluents, ought alone to be employed for evacuating the bowels; such as the *Seidlitz powders;* small portions of *Epsom salts*, preceded by a few grains of calomel; *castor oil*, with a few drops of laudanum; a mixture formed of magnesia, castor oil, and lemon syrup, constitutes an elegant, pleasant, and gentle laxative, which I have often used with very excellent effects. It is made by mixing very intimately in a mortar an ounce of the oil with a drachm of carbonate of magnesia, and then adding and mixing with it about an ounce of any of the usual syrups. Of this a large tablespoonful is to be taken every hour, until the bowels are moved. From two to three evacuations ought to be procured every twenty-four hours during the whole course of the disease.

* Medical and Surgical Observations, page 120.

Much of the treatment of fevers of this kind depends on the judicious management of purgatives. Circumstances may, indeed, occur, which will render the employment of an *active* purge peculiarly beneficial even in the latter periods of the disease. This is particularly apt to occur in those violent cases in which the liver at last pours out large quantities of black bile, and which, if not speedily removed, may cause a prostration or oppression of the system by exciting a state of general nervous irritation. Along with the remedies already mentioned, some advantage may be obtained from the usual antiphlogistic diaphoretics—such as the effervescing saline mixture, the spiritus mindereri, and the free use of bland acidulated drinks. The following mixture will be found a decidedly useful remedy in cases attended with much restlessness, anxiety, and a hot and dry skin, where there is no particular determination to, or excitement of the brain, and the febrile reaction is not very violent.*

℞.—Liquor Ammoniæ acetat. ℥vij.
Spir. nit. dulc. ℥j.
Tinct. opii. acetat. gtt. xxx.—M. ft. Of this a tablespoonful may be taken every three hours.

Nitre, with small portions of tart. antimony, dissolved in a bland mucilaginous fluid, will, in general, assist considerably in reducing the febrile heat, and promoting diaphoresis. We may also employ a solution of the *muriate of ammonia*, with much advantage, according to the formula given at page 100 of this volume. Indeed, this article administered in the manner directed by this formula, appears to me better calculated to do good in bilious remittents than nitre. It should be particularly observed, however, that both these remedies, more especially nitre, cannot be properly employed in cases attended with much gastric irritability, or gastro-enteric irritation.

When the skin is very hot and dry, during the exacerbations, the sufferings of the patient may be much alleviated by sponging the body with cool water, and suffering it to evaporate by the heat of the body.

The use of mild, cool and acidulated beverages ought to be enjoined as an important item in the treatment of this disease. Independent of the effects which drinks of this kind have in blunting the acrimony of the fluids lodged in the alimentary canal, they usually exert a soothing antiphlogistic influence upon the system, and they may do much good, moreover, by supplying the intestinal absorbents with a fresh and wholesome fluid, and thereby preventing or lessening the absorption of irritating or vitiated matters from the bowels. Drinks made with lemon or citric acid and sugar, are, perhaps, the best diluents for this purpose. Barley-water, acidulated with lemon juice; warm water poured on sliced apples, and afterwards suffered to cool—fresh orange juice diluted with cool water, or currant jelly mixed with water, are grateful and salutary beverages.

When, either from the imprudent employment of *irritating* purges, or from other causes, the mucous membrane of the intestinal canal is brought into a state of high irritation or subacute inflammation, the disease generally loses its remittent form, and often assumes a low typhoid character, with almost constant delirium, a tender and tympanitic state of the abdomen; a dry, dark-brown, or black crust on the tongue, with clean red edges; watery and reddish stools; great prostration, and a very dry and hot skin. Cases of this kind frequently run on for several weeks, and convalescence is always very gradual and tedious. When the fever assumes this aspect our remedial measures must be chiefly directed against the intestinal phlogosis. Leeching the abdomen will often afford much benefit, and it ought never to be neglected where leeches can be had. A large emollient poultice will assist, very materially, in reducing the intestinal affection. I am perfectly satisfied that we may, in general, derive much more good from applications of this kind than from blistering. Fomentations with

* Dr. Agnew on the late epidemic, intermittent, and remittent fever at Harrisburg. Vide Medical Recorder, vol. vi. p. 147.

flannel wrung out of hot water will answer the same purpose; but this mode of fomenting is more troublesome, much more variable in its impressions, than the application of warmth and moisture by means of a poultice, and probably not more efficacious. Internally I have exhibited small doses of calomel and opium in such cases with manifest advantage. The one-sixth of a grain of the former with a quarter of a grain of the latter may be given every two or three hours. The bowels must be kept open by laxative *enemata*, and the patient requested to take freely of some bland mucilaginous fluid, such as barley-water, very thin oatmeal gruel, or gum Arabic dissolved in water. No other articles of food must be allowed on any account. In such cases, I have thought that considerable benefit was derived from epispastics on the legs just above the ankles. This measure is particularly useful when the extremities are cool, while the skin of the body is hot, a circumstance which is not uncommon in instances of this kind. An emulsion of *balsam copaiva* also will frequently procure considerable advantage. I have so often seen the most decided benefit derived from this article, in protracted cases, attended with great irritation, or subacute inflammation of the bowels, that I should consider myself as neglecting an important curative means were I to omit prescribing it in diseases of this character. It may be given thus:

℞.—Bals. copaiv. ℥ss.
Sacch. albi ℥ss.
Pulv. gum Arab. ʒij.
Misce, dein adde,
Aq. fontanæ ℥ij—M. ft. Take a spoonful every two hours.

Although very considerable prostration often occurs in such cases, stimulants or tonics are by no means admissible, anterior to the period of convalescence.

Hitherto I have spoken only of the simple or less violent variety of remitting fever—of those remittents which occur in the temperate latitudes, and which, though sometimes both violent and rapid in their progress, do not assume that high and dangerous grade of febrile action which is so common and so fatal in hot climates. In the higher and malignant forms of remitting fever, a treatment somewhat different from the one I have just detailed is requisite. In these aggravated states of bilious remitting fever, the liver is deeply implicated, and the stomach is generally extremely irritable. Here, therefore, we cannot commence, as we may in the simpler forms, with emetics, or emeto-cathartics, and often not even with a purgative. Instead of irritating the stomach by medicines of this kind, our first object, often, must be to allay the excessive gastric irritability, in order to enable the patient to retain the remedies which his case may demand. Among the means which experience has shown best calculated to effect this purpose, blood-letting holds, perhaps, the first rank, where the arterial reaction is vehement. To be beneficial in this respect, however, it must be early and copious. I have known excessive irritability of the stomach and retching promptly checked, in the onset of the disease, by one efficient bleeding. Sinapisms over the epigastrium will sometimes aid considerably to moderate the excessive gastric irritability, but applications of this kind cannot be generally used with propriety until the reaction of the heart and arteries has been, in some degree, moderated by venesection. A draught of cold water is not only extremely grateful, but when the skin is hot and dry, often very beneficial in restraining excessive vomiting in cases of this kind. The saline effervescing draught, artificial mineral water, (carbonated water,) the warm bath, lime water, and sweet milk, spiritus mindereri, have all been recommended and used for this purpose. Sinapisms laid on the calves of the legs will sometimes speedily diminish the morbid irritability of the stomach in cases of this kind.

I have just stated that blood-letting is one of the best, if not the *most* effectual means for allaying the extreme irritability of the stomach which is apt to occur in the violent grades of this disease. This observation applies, however, to such cases only as are attended with high vascular reaction; for where the vital

energies are prostrated, this evacuation is of course inadmissible. Having allayed the gastric irritability where it was excessive, our principal reliance must be placed in the judicious employment of *calomel*. The liver, in this violent grade of the disease, is generally congested, torpid, or otherwise deranged to a very great degree; and our remedial efforts must, therefore, be particularly directed to this viscus. Experience, indeed, has fully demonstrated the excellent effects of *calomel* in this affection. There are some practitioners, it is true, of great respectability, who do not approve of the free employment of mercury in this disease: but by far the largest proportion of those who have practised in warm climates—particularly of the American and British practitioners—have given their decided testimony in favor of the mercurial treatment in the higher grades of miasmal fevers. In no country in the world, perhaps, is calomel so freely employed in the treatment of this malady as in the southern sections of the United States. The almost unanimous testimony of our southern physicians (many of whom are deservedly held in high estimation for their talents and medical acquirements), in favor of this practice, will scarcely permit us to doubt of its general usefulness. The American practitioner, free from the trammels of systems and the dogmas of the schools, pays no further regard to the *verba magistri* than is sanctioned by his own experience and observations. He inquires, observes, and reflects for himself, and adopts that mode of treatment which he finds, from varied experience, most successful. A practice which has received the approbation of a numerous portion of the profession, may be confidently regarded as founded on individual experience and observation, and not adopted on mere authority, and entitled therefore to full confidence.*

As it is of the utmost consequence to make an early and decided mercurial impression on the system, the calomel ought to be given in large and frequent doses. From ten to twenty grains should be administered every four or five hours, until the gums begin to show its influence, or until the evacuations become conspicuously bilious. While we thus endeavor to produce a general mercurial action, and especially to restore the regular functions of the biliary organs, the bowels should be kept freely moved by additional aperients, if the calomel do not produce this effect by itself. If the bowels be not freely evacuated by the first two doses of calomel, an additional purgative ought to be administered. For this purpose an ounce of the sulphate of soda, or of magnesia; or from fifteen to twenty grains of the compound extract of colocynth; or a dose of calomel and jalap, will generally answer well. In general, however, very *active* purges will be less beneficial or proper than the milder ones. Indeed, so long as the liver remains inactive and engorged, it will rarely be advisable to repeat even the purgatives I have mentioned. After the first efficient mild purge, it will be generally much the best plan to keep the bowels open by laxative *enemata*, and the use of tamarind water, or the Seidlitz powders, if these can be had. When the liver begins to act, and to pour its dark bile into the bowels, however, laxatives

* From 20 to 60 and even 100 grs. of calomel are frequently given at a dose, and in repeated doses, too, by eminent practitioners in the southwestern states, during the progress of their bilious fevers. They assert that such doses allay intestinal irritation, convert fluid into fecal discharges, and rouse and sustain the sinking energies of the system. I regard Dr. Cartwright, of Natchez, as one of the highest authorities in our profession, and would beg to refer every intelligent reader to his papers in the Medical Recorder. His views and statements have been corroborated by many of the best educated men I have met with from that region. They have been still further corroborated by the results of Dr. Annesley's experiments upon dogs in India. That gentleman proved that very large doses of calomel administered to dogs, would detach the intestinal mucus from the inner coat of the stomach and bowels, converting it by chemical action into a grayish saponaceous substance, which, admixed with bile, produced consistent fecal discharges, sometimes greenish, sometimes brown in color. At the same time the remedy contracted the blood-vessels of the mucous membrane and blanched all the parts, so as to remove every trace of vascular irritation or inflammation in them. We have often had opportunities of witnessing the same results in inflammation of the *conjunctiva*. Insufflation of calomel under the eyelids will often excite contraction of the distended vessels, and blanch the moist, red and engorged surface, relieving at the same time, all the sensations of irritation.—(Mc.)

of a more active character become indispensable. In cases attended with a distressing sense of sickness, accompanied with soreness in the epigastrium, leeching, succeeded by a large blister over this region, will often afford much relief. Experience does not, however, offer much in favor of the employment of blisters as a general remedy, either in this or the more mild variety of the disease.

Little or no advantage is to be obtained from the ordinary diaphoretic remedies in the higher grades of the disease. *Nitre*, indeed, and the antimonial preparations are wholly out of the question where there is much gastric irritability. Where the stomach will bear it, *James's powder*, in small doses, with calomel, may often be advantageously employed. The saline effervescing draught, and the spiritus mindereri, will sometimes aid in allaying the sickness of the stomach, and removing the torpor of the cutaneous exhalents. In all instances, perhaps, the enjoyment of cool, acidulated drinks—such as lemonade, thin barley water, with a little fresh lemon juice, ought to be freely allowed. Tamarind water also is an excellent beverage in cases of this kind, on account particularly of its aperient properties. Drinks of this kind tend to moderate the intense febrile heat, and they do good, moreover, by diluting and obtunding the acrimony of the vitiated fluids, which are almost continually generated in the alimentary canal.

The propriety of employing tonics during the remissions of the disease is a point which has been very variously represented by different writers. Lind, Clark, Balfour, and a host of others contend zealously for the vigorous exhibition of bark as soon as a considerable remission occurs in the disease. Dr. James Johnson, on the contrary, with a number of other late writers on this disease, condemns this practice in terms of unqualified reprobation. Dr. Burnet, in his Essay on the Bilious Remittents along the Mediterranean, asserts that, under "the use of the cinchona, the mortality has been great; relapses frequent; and the supervention of dysentery manifestly more frequent." I presume that the *cinchona* may be injurious, or beneficial, according to the period of the disease, or the circumstances under which it is administered. Where there are no violent visceral congestions—where the liver has resumed its regular action, and where, with these favorable circumstances, the remission is complete, the bark or the quinine in *large doses* will often do a great deal of good. The authority of many of the most respectable of our southern brethren might be cited in confirmation of this remark. There can be no question, however, that so long as the liver remains torpid and engorged, or where strong local congestion, inflammation, or irritation is present, the bark will not only be useless, but, generally, decidedly injurious. No matter how slow and soft the pulse may be, so long as the abdomen remains tender to pressure, the tongue and skin dry, and the alvine discharges free from bile, bark and all other tonics are contra-indicated, and cannot be resorted to without great risk of irreparable injury. When, on the other hand, the occurrence of a remission is attended with a soft and moist skin and tongue, signs of bile in the stools, and freedom from abdominal tenderness, the quinine will, in general, prove highly beneficial.*

The affusion of cold water has been highly extolled by some in the treatment of this disease. It does not appear, however, that this measure is calculated to do any good in the more violent grades of bilious remittents, where strong congestions and derangements of the biliary organs are present, or where the bowels are loaded with bilious and other saburral matter. (Richter.) Where these objections to its use do not exist, and the skin is very hot and dry, and violent pain in the head, with delirium, is present, cold water thrown on the patient will often produce prompt and manifest abatement of the febrile symptoms. It is, notwithstanding, a good general rule to delay the cold affusions until evacuations

* [Here also our south-western friends astonish us by the enormous doses of quinine which they throw into the stomach. From 10 to 30 and even 60 grains are given in this crisis at a dose, and repeated until the febrile symptoms yield. Some, however, are compelled to believe that the article must have been hugely adulterated to admit of such profusion.—Mc]

both by venesection and by the bowels have been premised; and, above all, they must never be used unless the skin be dry and above the natural temperature.

During the period of convalescence, mild tonics—such as infusions of cinchona, gentian, columbo, or serpentaria, will generally assist in restoring the tone of the digestive organs. The bowels must not be suffered to remain constipated; and the diet should be simple, mild, and digestible—such as animal broths, rice, barley, a little boiled or broiled mutton, lamb, or tender beef.

CHAPTER VII.

YELLOW FEVER.

Synonymes.—Typhus Icterodes; Maladie de Siam; Bulam Fever; Vomitus Prieto.—Causes.

Yellow fever has been the theme of interminable discussion and controversy—a theme which has drawn forth the best and the worst feelings of the human heart—which has furnished motives, on the one hand, for the most active exertions of philanthropy and self-devotedness, and, on the other, for all the bitterness and uncharitableness of feeling which man, in his most degraded moments, is capable of manifesting.

There is no form of fever more variable in the violence and character of its symptoms than the present one. In the seasoned and acclimated inhabitants of those regions where the disease is endemic, it is often as mild as ordinary bilious fever. But in the young and robust, who have not yet been seasoned to the climate, it seldom fails to make its attack with an overwhelming force; commencing and terminating in death often within forty-eight hours, and sometimes sooner.

The disease usually begins with a sudden feeling of giddiness, pain in the back, loins, and extremities, faintness and debility, with slight creeping chills and nausea. After a period varying from a few to twelve hours, these symptoms are succeeded by a sudden development of vehement arterial reaction, accompanied with a dry and intensely hot skin, flushed face, red eyes, extreme headache, tormenting thirst, intolerance of light, pain in the loins and lower extremities, a sensation of weight and tension at the stomach, white, and sometimes clean tongue. Towards the end of the first twenty hours of fever, the patient begins to vomit frequently, particularly after taking drinks. The ejections consist, at first, of such fluids only as may have been taken into the stomach; but after these have been thrown off, bile, often in abundance, is brought up, varying in color from pale yellow to dark green, and frequently so acid as to excoriate the fauces and lips. The heat and tenderness in the epigastrium now increase, the countenance assumes an indescribable expression of distress and hopelessness; there are great restlessness and sighing, and more or less delirium usually supervenes. In some cases slight pain is experienced on swallowing; "and about this time an urgent sensation of hunger often comes on, and a remarkable want of power in the lower extremities, resembling partial paralysis." This paroxysm lasts, commonly, from twenty-four to thirty-six hours, but in some instances considerably longer; and then all the symptoms, with the exception of the nausea and the vomiting, greatly abate—the pulse returning to its natural standard, and the skin acquiring a moist and temperate condition. So complete, indeed, is the remission in some cases, that the patient is induced to flatter himself that all danger is now passed. More commonly, however, the patient remains in a state of tranquil indifference,

amounting to a sort of stupor, without any apparent concern as to present or future situation. This is an ominous calm; for, after a few hours, the pain and burning sensation in the stomach return with increased violence; the vomiting becomes frequent and distressing—the fluid brought up containing minute flakes or flocculi, resembling the crust washed from a port-wine bottle, but little or no bilious matter. The desire for cool drinks is extremely urgent, but everything which is swallowed is immediately rejected by the stomach with great force. The eyes and skin about the neck and breast now acquire a yellow hue. This second paroxysm continues, commonly, from twelve to thirty-six hours, and is succeeded by a new train of symptoms, which mark the last or third stage of the complaint. The pulse now sinks in frequency, force, and volume; the tongue is dark-brown or black; the vomiting becomes almost incessant, and exceedingly forcible, the matter thrown up consisting of a black ropy fluid resembling coffee grounds suspended in a glairy liquid. The extremities become clammy and cold; and the acrid or burning sensation in the stomach acquires a most distressing degree of violence. Diarrhœa usually occurs at this period—the discharges being green or black; "and the patient often complains of being unable to pass his stools, from a want of power in the abdominal muscles." By this time the whole surface of the body is of a dirty yellow color; and hiccough, hemorrhages, violent delirium, coma, insensibility, or convulsions, sooner or later terminate the patient's sufferings in death.

Such is the ordinary course of this fatal malady. In many instances, however, the attack is much more overwhelming; the patient being seized at once with loss of muscular power, and general oppression of the nervous system—falling down as if stunned with a blow. In other instances, violent and furious delirium, or mania, ushers in the disease, terminating in a few hours in insensibility and convulsions. Sometimes the disease commences and proceeds to a fatal termination in so insidious a manner, that the patient himself and those about him are scarcely aware that he is much indisposed. In such cases there is, however, always a remarkable change in the expression of the patient's countenance, as well as his usual temper and habits. In almost all instances of this disease, the countenance is expressive of intense anxiety and despair during its early period, and of gloomy or sullen abandonment in the last stage.

The period at which the skin begins to assume a yellow color, is very variable. It sometimes occurs within the first forty-eight hours, and sometimes not until the fourth or fifth day. Various opinions have been expressed with regard to the immediate cause of this yellow hue of the surface. Some ascribe it to the serum rendered yellow by dissolved red globules of the blood, and effused under the cuticle. Dr. Fordyce attributes it to the superabundant secretion of sebaceous matter by the glands of the skin; and Dr. Saunders supposed it to depend on a peculiar state of the lymph in the subcutaneous cellular tissue. Many, however, maintain, and with correctness, I think, that the yellow hue in question, is of an icteric character, depending entirely on deposition of bilious matter under the cuticle.

The black matter thrown from the stomach in the latter period of this disease, does not consist of bile, as was once generally supposed, but of minute flakes of coagulated blood suspended in the gastric mucus, produced by sanguineous exhalation from the abraded surface of the mucous membrane of the stomach. The black matter discharged in some of the higher grades of bilious and typhus fevers differs essentially from the "black vomit" of yellow fever. The former will dissolve in water, and communicate a bilious tinge to it; whereas the black matter which forms the *black vomit* of the present disease, consists of small insoluble flakes which are held suspended in a viscid fluid, and will not communicate a yellow or greenish tinge to water when agitated with it. "In taste also they differ. The black matter which occurs in common bilious fever, is always in-

tensely bitter; but that which is thrown up in yellow fever, is either insipid or acid."* (Bancroft.)

Post-mortem appearances.—The stomach and liver are the organs upon which the disease exerts its principal force. The former, especially, always shows the strongest marks of previous inflammation and its consequences. Its coats are often thickened, and the mucous membrane is always strongly injected, abraded, and in many parts gangrenous, or totally disorganized. The duodenum and small intestines also almost invariably exhibit marks of inflammation. In many of the more aggravated cases, the liver undergoes much structural derangement. Dr. Chisholm has found the liver "in a dissolved or putrid state or sphacelated, and of the consistence, feel, and color of rotten cork, or full of abscesses." Dr. Physick rarely found the liver much diseased, but the stomach was always inflamed and gangrenous in parts.†

Causes.—In relation to the origin and mode of dissemination of yellow fever, physicians have been at great variance; and the subject is still much disputed, although the weight of good testimony is greatly on the side of its miasmatic or domestic origin. After an attentive examination of the principal observations which have been published on this subject, it appears, indeed, difficult to adopt any other opinion than that which alleges its origin from miasmatic effluvia, "exhaled from masses of public filth containing putrescent matter, generated under a high range of temperature." That this is the case, seems to be sufficiently demonstrated by the following circumstances:—1. Yellow fever always appears in the lowest and most filthy parts of towns; and those localities in which it is most prevalent, are in the immediate vicinity of marshes or soils favorable to the production of miasmata. 2. Yellow fever never occurs in cold seasons—a high range of atmospheric temperature being essential to the generation of its cause. 3. Heavy rains, storms, and the supervention of cold weather, never fail to put an immediate check to the disease.‡ 4. Yellow fever always appears simultaneously, and is intermixed with bilious remittents. Dr. Ramsay states, that in the yellow fever of Charleston, in 1804, "neglected intermittent frequently terminated in yellow fever." Dr. Rush also states, in relation to the yellow fever in this city in 1802, that "intermittents, the mild remittent, the inflammatory, bilious, and the malignant yellow fever, have in many instances all run into each other;"§ and he observes that Dr. Saunders, nearly a century ago, noticed this conversion of marsh and yellow fever into each other. Yellow fever is, moreover, always most severe in the immediate vicinity of those localities which favor the generation of marsh miasmata. Dr. Caldwell, speaking of the yellow fever of this city in 1803, says, "as the fever receded from the low ground and malignant atmosphere of *Water* street, it became more and more mild and manageable till its evanescent shades in Second street were, in many instances, much lighter than the common remittent of the country." During the prevalence of the yellow fever in Baltimore, "the bilious or remitting fever in its ordinary form, prevailed in that town and continued until it was gradually lost in the severer form of yellow fever as the season advanced." (Davidge.) 5. The miasmatic origin of the disease may be inferred also from the fact, that the recurrence of it has often been, in a great measure, prevented by removing the sources of pestiferous exhalations, in situations where it formerly prevailed, almost annually, to an alarming extent. Our own city may be cited as a prominent example of the efficacy of

* Mr. Lyon, staff surgeon in the Island of Dominica, says that the black matter ejected from the stomach in yellow fever, is invariably very strongly acid. He ascribed the black color of the blood to the action of muriatic acid on it; for it is this acid, which, according to the investigations of Prout and others, is secreted by the stomach in a state of disease. "Having made the experiment of adding muriatic acid to blood, the color of the blood was instantly changed to a deep black, and when diluted with water, presented a liquid, which I should have declared from mere inspection, to be black vomit."—*Lond. Med. and Phys Journ.*, 1829.

† New York Medical Repository.

‡ Rush's Medical Inquiries.

§ Medical Repository for 1802.

cleanliness in preventing the occurrence of this disease. (Bancroft.) If these views be correct, in relation to the origin of the disease, we are forced to reject the opinion so stoutly maintained by some, of its being in any respect contagious. Indeed, if yellow fever did possess the power of generating its own virus, and communicating itself by contagion, the fact, as Dr. Bancroft observes, must have been proved ten thousand times by the most irrefragable testimony, and yet there is, perhaps, no *incontestable* case on record where the disease was thus communicated. The city hospitals established in the neighborhood of this city and at New York, furnish us with a striking refutation of the supposed contagious nature of this disease; for, in no instance, was the disease communicated to those who were employed about the sick. The same observations were made at the encampment near Baltimore, during the prevalence of this disease in that city in 1819. The recent very ample investigation of this subject by Dr. Chervin, has resulted in a mass of testimony, which can scarcely leave any pretext for doubting the non-contagious nature of this disease. But, although yellow fever be not contagious, it may, no doubt, be introduced into seaport in ships. Unquestionably, a pestiferous miasm may, under favorable circumstances, be generated in the holds of ships while navigating in hot climates which, when suffered to escape at the wharves, may give rise to the disease in question. When the miasmata are thus introduced, however, the disease engendered by it will not prevail epidemically, but only among those who approach the infected vessel, or the cargoes, and will disappear entirely when these are removed to a distance. (Bancroft.) The sporadic cases which occurred at the Wallabout, in 1804, at Perth-Amboy, in 1811, at Middletown, in Connecticut, in 1819, and at New York in 1824, were distinctly traced to vessels that had recently arrived from warm climates. The circumstances of the ship Ten Brothers, at Boston, in 1819, afford a striking example of the production of deleterious miasm in the holds of ships, capable of producing yellow fever.* This vessel having arrived at Boston on the first of August, a number of persons went on board while the cargo was being discharged; and out of these, twelve individuals, living in various parts of the city, were seized with malignant fever, nearly all of whom died. The disease was not, however, communicated to a single person of those who visited the sick.

Observation would seem to show, that those who had once suffered an attack of this disease, are afterwards, in a great degree, insusceptible of another attack. In hot climates, where the disease is endemic, persons recently arrived from more temperate latitudes are almost exclusively obnoxious to this disease. The acclimated are, in a great degree, exempt from its attacks, and when it does occur in such individuals, it almost always is of a comparatively mild and tractable character. The influence of the remote cause of this form of fever is greatly promoted by intemperance, excessive exercise in the sun, exposure to a damp and cold night air, and, in short, by whatever is capable of debilitating either the whole system, or deranging important organic functions.

Treatment.—If yellow fever has been a fertile subject of dispute in relation to its pathology and cause, it has afforded no less scope for contention with regard to its remedial management. Whilst some strenuously recommend a prompt and energetic treatment, others, condemning the lancet, mercury, and active purgation, advise nothing but the mildest and most soothing remedies. From a careful estimate of the best authorities on this head, however, it would appear that the chances of success are on the side of an energetic plan of treatment. This disease is highly phlogistic, and gastro-enteric inflammation is a very common occurrence—more especially in young, robust, and unacclimated subjects. In cases where the arterial reaction is vehement in the onset of the disease, general blood-letting is often promptly and conspicuously beneficial. To obtain the full advantages which this evacuation is capable of affording, it must be early and very efficiently practised. Those who have employed blood-letting

* Medical Recorder.

with the greatest success, are unanimous in restricting its use to the first stage of the disease. Dr. Robertson, in his account of the yellow fever of New Orleans, states, that during the first twelve hours, he frequently drew from fifty to sixty ounces of blood;* and Dr. Belcher bled to the extent of from fifty to eighty ounces in the first stage, with much advantage.† In a disease so impetuous in its attack, and so apt to develop local inflammations, much, and often everything, depends on an early and powerful antiphlogistic impression on the system. Where the reaction of the heart and arteries is vigorous, the blood should be suffered to flow until fainting approaches, "for it is not only by unloading the vessels, but by the *shock* also which it gives to the system, that blood-letting proves so serviceable in inflammatory fevers." Dr. Anthony Musgrave states, that as soon as the febrile reaction was developed, after the invasion of the disease, he derived the greatest benefit from the immediate and rapid abstraction of blood, to an extent limited less by the quantity than by its decided effect upon the action of the heart and arteries.‡ Dr. Rush, as is well known to the profession of this country, was a zealous advocate for blood-letting in the disease. "I paid no regard," he says, "to the dissolved state of the blood, when it appeared on the first or second day of the disorder, but repeated the bleedings afterwards in every case when the pulse continued to indicate it." "In a disease like this," says Dr. Robertson, "where the danger is frequently imminent in twelve hours, it is often surprising to see how much its apparent character may be altered by active depletion." A host of other able practitioners might be cited in behalf of the usefulness of this practice. In those instances of the disease, however, where the nervous system appears to be in a manner overwhelmed by the remote cause of the fever, when the patient exhibits an air of confusion or intoxication, with great agitation, "and a dash of wildness gleaming at intervals over his agonized features;" when he complains of little or no headache, but is impatient and irritable, yet oppressed; and after the first days sinks down with a careless expression of resignation—in such cases blood-letting is wholly inadmissible. Here we must rely chiefly on the prompt and liberal administration of *calomel* with a view to its salivant operation.

The efficient abstraction of blood in the commencement of the disease serves not only to break down the violence of the phlogistic excitement, but often contributes materially towards allaying the excessive irritability of the stomach, frequently so distressing in this malady.

Purgatives, also, are highly useful remedies in this disease, though, like blood-letting, their good effects are almost entirely confined to the early periods of the disease. Calomel and jalap, in doses of ten grains of each, was a favorite purgative with Dr. Rush. As calomel is, however, very generally admitted to be one of our most useful remedies in this disease, both on account of its purgative effects and its *specific constitutional* influence, it will be better to exhibit it by itself in doses of from ten to fifteen grains every three or four hours, and to promote its purgative operations by laxative enemata, after the second or third dose has been taken. In this way copious alvine discharges will generally be effected, and the system early brought under the mercurial influence. Should the bowels, however, not be sufficiently evacuated by these measures, a dose of Epsom or Glauber's salts ought to be administered. When the bowels have been thus once freely evacuated, they must be kept in a loose state by means of the milder laxatives; such as Seidlitz powders; small portions of the saline purgatives, or the occasional use of enemata. It should be observed, however, that mercury, with a view to its constitutional operation, can seldom be serviceable, so long as the arterial action remains unsubdued in the commencement of the disease. Indeed, almost all attempts to produce ptyalism under such circumstances are fruitless.

* Johnson on Tropical Climates, vol. ii.
† Edinburgh Med. and Surg. Journal, 1825.
‡ Treatise on the Yellow Fever of Antigua.

Decisive blood-letting in cases of this kind must be regarded as an essential preliminary to the use of mercurials. In cases of less vehement grade of febrile reaction, where the disease assumes more of a congestive character, the *early* induction of salivation is particularly desirable—and our principal object should be to produce this effect as speedily as possible. Dr. Musgrave observes, "that in the more concentrated form of yellow fever, experience leads me to believe that mercury, administered with a view to its salivant effects, may be judiciously dispensed with. But there is a form of this disease, which, from its insidious approach, is peculiarly calculated to lull the patient into mistaken security," and thus to baffle, in its subsequent progress, the best directed efforts; and this form is undoubtedly treated with great success by the rapid induction of ptyalism.*

In cases where the febrile reaction is strongly developed, the skin is always extremely hot and dry during the first period of the disease, and nothing is more refreshing than sponging or ablutions with cold water under such circumstances. Most writers prefer pouring it forcibly on the patient's body. Dr. Johnson observes, that "the greater the force with which the water is applied, the more benefit will be derived from it."† When the head is much affected during the first stage, considerable benefit may be obtained from cold applications to the shaven scalp. Bladders partly filled with water containing a lump of ice, is the most convenient and effectual mode of applying cold to the head. For the same purpose blisters are recommended by some, but their usefulness in this respect is very questionable, and certainly much inferior to the application of cold, so long as the arterial reaction is vehement. Draughts of cold water are generally very grateful to the patient, and have the effect often of moderating the heat, predisposing to perspiration, and of relieving the gastric distress. (Johnson.) Emetics are very generally, and with justice, condemned in the treatment of this disease. The gastric irritability and tendency to inflammation is so great in this affection, that mischief would almost inevitably result from the operations of this class of remedies. Nevertheless, we are told by Dr. M'Arthur, that where the disease commences with diarrhœa or dysenteric symptoms, emetics may be frequently given with considerable advantage. Besides the means already mentioned for allaying the extreme irritability of the stomach, and restraining the vomiting so distressing in the disease, we may also derive much advantage from the application of leeches or blisters to the epigastrium, more especially after the impetus of the circulation has been in some degree moderated by an efficient bleeding. When the disease has passed on to the second period, we must depend on the use of mild aperients, diaphoretic and cooling beverages, enemata, cold affusions when the skin is hot and dry, and calomel, in reduced doses. A great deal, however, of the success of our remedial efforts depends on the proper management of the disease in the first period. As a diaphoretic, we may use the spiritus mindereri, or the saline effervescing draught. When, after the second exacerbation, the pulse and temperature sink, recourse should be had to the active tonics—and of these, the *cinchona* or quinine is the most efficient. The latter, especially, seems to have done much good in this disease.‡ These articles should be administered in as large and frequent doses as the stomach will bear. Dr. Musgrave resorted to the cinchona in the less vehement cases, with much good effect, as early as the first remission, having previously evacuated the bowels thoroughly. From five to ten grains of quinine may be given every hour or two during the remissions, and it may be given in conjunction with calomel, during the first periods of the disease.

In the latter stage of the disease, the bark, quinine, wine, and ammonia, constitute almost the only remedies that can be employed with any prospect of advantage. Stimulants, however, are not so well calculated to do good in the

* Edinburgh Med. and Surg. Journ, 1827.
† Influence of Tropical Climates, vol. ii. p. 182.
‡ Journal des Ausländishen Literature, &c. Von Drs. Julius and Gerson.

sinking stage of this form of fever, as in that of typhus. The spirits of turpentine has also been recommended in the treatment of yellow fever, but it does not appear that its powers are sufficiently valuable in this respect to entitle it to much attention.

It is proper to state that many of the West India practitioners adopt a plan of treatment far less energetic than the one just detailed. They employ little else than mild aperients, with copious draughts of acidulated drinks, enemata, and external cold applications.

CHAPTER VIII.

CONTINUED FEVER.

Although the varieties of fever which are arranged under the present general head are termed *continued*, in contradistinction to the forms of fever considered in the two preceding chapters, yet, with the exception of the *ephemera*, a fever strictly *continuous* or unremitting in its course, is in reality a phenomenon of the rarest occurrence. Whether the operations of the animal economy be carried on in a state of health or of disease, regular periodical fluctuations appear constantly to obtain in the excitement or actions of the system. In every form and variety of fever, there seems to exist a natural tendency in the general morbid excitement or symptoms, to remit or abate in their violence at some period during the day; and this remission, in perhaps ninety-nine cases out of a hundred, occurs during the morning. In the fevers denominated continued, however, these temporary abatements in the violence of the symptoms are generally slight, and frequently very transient; they usually occur very early in the morning, and seem to be the result of the abstraction of the stimulus of light, sound, &c., during the night, in conjunction with the natural tendency of the actions of the system to abate at this period.

Continued fever occurs under a variety of prominent modifications, and under every grade of febrile excitement, from the feeble and sinking reaction of typhus, to the vehement and tumultuous actions of synochal fever. Agreeably to this circumstance, it has been customary to divide continued fevers into *sthenic* and *asthenic*, or *inflammatory* and *typhus*. That there exists a very material difference between the low fevers denominated typhus, and those usually termed inflammatory, is quite obvious. The term inflammatory, nevertheless, does not seem to be strictly appropriate as a *distinctive* appellative in this place; for that irritated excitement which constitutes fever is always necessarily inflammatory in its general character, whether the reaction be feeble and sinking, or vigorous and ardent. Mere grade of energy or activity is to be regarded as an accidental and variable quality of inflammatory excitement. Fever consists essentially in an irritated action of the sanguiferous system, and this irritated condition may be connected either with *increased* or *decreased* energy of the vital powers. In pure synocha, the heart and arteries are in a state of morbid action, with *increased* powers of acting; whilst in typhus fevers the general irritated excitement is connected with fundamental *debility* of the vital powers. In either case, however, the irritated vascular action is essentially phlogistic, and equally prone to give rise to local inflammations. The diversities which occur in the general character of continued fevers, depend mainly on the differences which occur in relation to the degree of vital energy enjoyed by the system, and this diversity in the general energies of the system itself, would seem to depend on the greater or less degree in which the nervous system becomes implicated in the disease. The brain is

the fountain whence the animal economy draws its powers of action; and whenever this source of the vital forces becomes injured or impeded in its operations, debility, corresponding to the degree and character of the cerebral affection, will be manifested in the actions of the system. In the high and vigorous synochal fevers, there are rarely any considerable manifestations of cerebral disturbance; whereas, in all those fevers which are attended with prostration and feebleness, the brain and nerves are generally prominently disordered throughout the whole course.

There exists no small degree of difficulty in arranging continued fevers under such heads as will exhibit a distinct and comprehensive view of all the prominent modifications or forms in which they are wont to occur. In relation to the *grade* of febrile excitement, fevers may be divided into *three* principal varieties: namely, *synocha*, *synochus*, and *typhus*.

1. *Synocha.*—This head embraces all those fevers which are conspicuously *inflammatory*, both in relation to their general and local phenomena. They are usually divided into *idiopathic* and *symptomatic;* the former constituting what is generally termed simple *inflammatory* fever; and the latter embracing those fevers which result from acute local inflammation. Hardness, thickness and tension of the pulse, are essential characteristics of *synochal* fever; but in relation to the size and activity of the pulse, there exists great diversity in the different varieties of this grade of fever. In simple inflammatory fever the pulse is *full*, vigorous and hard; whilst in some of the phlegmasiæ, in acute gastritis, enteritis and peritonitis, its volume is usually small, although its firmness, tension and quickness are conspicuous, and the necessity of prompt and vigorous depletory measures extremely urgent. The blood in synocha is thicker, and contains a smaller proportion of serum than in health, and is disposed to separate speedily and very completely into its constituent parts. The crassamentum becomes dense, concave, or cupped on its superior surface, and coated with a thick layer of yellowish fibrin. The albumenoid, or coagulable portion of the serum, does not become condensed when subjected to the action of heat, alcohol, &c., but is converted into a white pap-like matter. Boiling water poured into the serum of blood taken from a patient laboring under synocha, converts it into a whey-like fluid, resembling a solution of soap in water, without any coagulated flakes.*

In synocha, the general energies of the system manifest no proneness to prostration, so long as the fever retains its *simple* character. The powers of vital resistance continue to the end, with no material impairment. When general fever of the synochal grade passes into a low or typhoid state, it is either in consequence of inordinate sanguineous depletion, or of the supervention of cerebral inflammation, or the occurrence of inflammation and gangrene in other organs.

Simple continued fever of the synochal grade, is rarely attended with conspicuous symptoms of sensorial disturbance, or cerebral irritation; nor is it common to meet with signs of gastro-intestinal irritation in cases of this kind. Fevers, however, rarely preserve the simple synochal character throughout their whole course. In most instances, local inflammation supervenes in some part or other. When the inflammation falls upon a fibrous structure, or upon one of the solid viscera, the energy of the febrile reaction will be increased, or at least sustained; but when it happens to appear in the mucous membrane of the alimentary canal, the brain generally becomes more or less oppressed, and the general powers of the system tend to a state of prostration.

The secretions in synocha are almost universally diminished in quantity. Cold or atmospheric vicissitudes, and a high degree or solar heat, are almost the only *general* causes of this grade of fever.

Synochus.—This grade of fever is intermediate between the purely synochial and the typhus varieties of fever, and constitutes by far the most common modi-

* Reil, über die Erkentniss, &c., der Fieber. Band. i. s. 494. See also Parmentier and Deyeux's Memoir in Reil's Archives für die Physiologe and B. 1, No. 3, s. 5.

fication of febrile reaction. It is the grade of fever which occurs in intermittents, remittents, bilious fever, and the common continued fevers which arise from *cold* and from gastric irritation. The pulse of synochus fever is active, more or less full, frequent, compressible, and free from unusal tension or hardness. The blood itself rarely differs perceptibly from its natural character, being devoid of the above-named inflammatory characteristics. *The system is much less able to resist the influence of debilitating causes than under the preceding grade of fever.* It will bear a degree of depletion while laboring under synocha, which, in a fever of the *synochus* grade, would produce the utmost degree of prostration.

Synochus is employed here as indicating merely a certain grade of febrile excitement, and not as constituting in itself a distinct form of fever. The reaction of the heart and arteries is only one of the series of morbid phenomena which constitutes fever, and the same grade of vascular reaction occurs in maladies essentially distinct from each other. So far, indeed, as the mere action of the heart and arteries is concerned, fevers differ from each other only in *degree;* or, to adopt the language of Parry, in the greater or less momentum of the blood. It is in the capillary system of vessels, that the fundamental morbid condition resides, which establishes the essential difference of febrile diseases. The morbid excitement of the capillaries in a case of small-pox must be very different, one should think, from that which occurs in this system of vessels in remitting fever, and both may nevertheless be attended with the *synochus* grade of febrile reaction.

Typhus.—This grade of fever is lower than the preceding one, the vital powers being more prone to sink, and, in general, much less able to resist the influence of debilitating remedial measures. It is characterized by a weak, small, quick, and generally frequent pulse. In some instances, however, of a typhous state of fever, the pulse is nearly natural in frequency and fullness; but softness and feebleness are seldom absent, except in the commencement of the disease. An early disturbance of the sensorial powers, and a train of various nervous symptoms, almost universally attend fevers of the typhous kind.

There are three apparently very distinct varieties of typhus fever. One of these varieties is characterized by what may be called a highly nervous state of the system—the patient manifesting along with a weak condition of the vital powers, a peculiar degree of nervous excitability and excitation, and an active state of the sensorial functions. This constitutes what was formerly usually described under the name of nervous fever, the *typhus nervosus, pyrexia nervosa, neuropyra, typhus cum erethismo*, and the *febris nervosa simplex* of authors.

Another variety of *typhus* fever in connection with the deficient or sinking energies of the system, is characterized in its progress by phenomena which have been generally regarded as indicative of a tendency to putridity; the pulse, at first moderately full and active, soon becomes soft, feeble, sometimes *frequent*, and at others slower than natural, the skin is pale dingy, or sallow, its heat elevated, and of the kind called *calor mordax*, or in some instances nearly natural, and sometimes even below the natural standard. The breath, secretions, and exhalations are offensive to the smell; petechiæ, extravasations, colliquative hemorrhages from the gums, the fauces, the eyes, the bowels, &c., ensue towards the conclusion of fatal cases. This variety of *typhus* fever has been described under various denominations; such as *f. colliquativa, f. putrida sanguinea, f. putrida simplex, f. sepedogenetica, f. adynamica, typhus putridus, synochus putridus, pyrexia myoica, pyrexia denophlebica, f. hæmatoseptica, septopyra, putrid fever, putrid nervous fever, typhus gravior*, &c.

There is a *third* variety of low fever, which, along with its radical tendency to prostration, is strongly characterized by a very *conspicuous torpor of the sensorial, intellectual and general nervous functions.* Its first stage is often attended by the *synochus* grade of vascular reaction, whilst the second stage is marked by torpor, great prostration, and feeble arterial action. Its different stages are more definite in their duration, and its essential phenomena succeed

each other in a more regular order than those of other continued fevers. This constitutes the genuine *typhus*—the *typhus contagiosus* of authors—a form of fever which by many is believed, and I think with correctness, to be radically diverse from every other form and variety of febrile disease.

Having made these general remarks on the principal grades and modifications of continued fevers, I pass on to the consideration of particular forms of fever.

Sect. I.—*The Synochal grade of Idiopathic Fever, or Simple Inflammatory Fever; Febris Irritativa; Pyrexia Sthenica; Febris Vasorum; Inflammatoria; Enechia Cauma.*

This variety of continued fever is attended with the highest grade of febrile excitement, associated with increased *irritability*, as well as *increased power of action* in the heart and arteries. The premonitory stage is always short, the fever coming on suddenly with distinct chills or rigors, the febrile action is rapidly developed, the whole surface becoming speedily intensely hot,* the pulse full and vigorous, and rarely above one hundred and twelve in a minute, the face flushed and turgid, the eyes suffused, sparkling, and unusually sensible to the light, the temples and carotids throbbing, the head painful, the mouth and throat very dry, the breathing oppressed and hurried, the thirst for cold water very urgent, the tongue covered with a white fur, the bowels torpid, the urine very high-colored, and small in quantity, the skin dry, harsh and suffused with a slight blush, and the ears morbidly sensible to sounds. Delirium is not a usual occurrence in this variety of fever; but when it does supervene it generally becomes extremely violent, and greatly increases the unfavorableness of the case from its dependence, generally, on cerebral inflammation. The blood, when drawn, exhibits the inflammatory character already mentioned, i. e., the buffy coat,† cupped crassamentum, a paucity of serum, &c.

These symptoms usually suffer regular remissions and exacerbations; the former occurring in the morning, and the latter in the evening, until they finally terminate entirely under some critical evacuation. Simple synocha, or inflammatory fever, very rarely continues beyond the ninth day, and still more rarely beyond the fourteenth, and not unfrequently terminates its course as early as the fifth or seventh day. When the termination occurs about the seventh day, the symptoms usually go on increasing in violence to the fourth or fifth day; and when the disease is prolonged to the fourteenth day, the increase generally continues to the ninth, or perhaps the eleventh day.

The resolution of inflammatory fever is almost invariably accompanied by general and free perspiration, together with its never-failing concomitant, a reddish or pale sediment in the urine. In some instances, a slight hemorrhage, particularly from the nose, accompanies the crisis. In general, these critical discharges take place a few hours after an evening exacerbation, and this exacerbation is often ushered in by a slight chill.

* The heat of the skin is of the kind usually called *burning*, in contradistinction to that peculiar biting or acrid heat which occurs in typhus fevers, termed *calor mordax*. By laying the hand on the skin of a patient laboring under inflammatory fever, the sensation of heat communicated is at first very considerable, but on suffering the hand to remain for a short time, the sensation of heat gradually diminishes, until it seems to the touch but little above the natural temperature of the body. In typhus, on the contrary, the longer the hand is suffered to be in contact with the patient's body, the more pungent and perceptible does the heat (calor mordax) become, and the biting or acrid sensation of heat remains in the hand even after it is removed from the patient.

† The buffy coat, which occurs in inflammatory fevers, differs from a somewhat similar appearance observed sometimes on the blood of typhus patients. The former is of a uniform yellowish color, and very tenacious, whereas the latter is brittle, of a paler yellow, and presents an iridescent appearance, reflecting some of the colors of the rainbow when held in certain positions to the light.

Inflammatory fever does not, however, often continue its course throughout in the regular and simple form which has just been described. Topical inflammations, of more or less intensity, very seldom remain wholly absent in the progress of the disease. The human system is rarely in such a condition as that some organ or structure is not in a state of predisposition to inflammation; and there can scarcely be a circumstance better calculated to produce inflammation in a part thus predisposed than the very greatly augmented momentum and peculiar condition of the blood which exist in this variety of fever. When local inflammation supervenes in the course of a simple synochal fever, the general aspect and disposition of the disease will, of course, be considerably altered. Sometimes the brain and its meninges become inflamed, at an early period of the disease; but this occurrence is much less common in the synochal than in the synochus and typhus grades of idiopathic fever. Occasionally synochal fever, after having continued for a day or two, becomes complicated with rheumatic inflammation; and in some instances inflammation occurs in one or more of the thoracic or abdominal organs. In general, the more the brain becomes affected, either by inflammation or sympathetic irritation, the more apt will the system be to sink into a state of prostration or oppression. When the febrile reaction is extremely vehement, or the system habitually delicate and feeble, simple inflammatory fever sometimes exhausts the vital energies, and passes into a low or typhoid state.

The constitutional predisposition to synochal fever would seem to consist in a vigorous condition of the vital powers, robust health, activity of the digestive and nutritive functions, and an irritable plethoric habit. Persons between the fifteenth and fortieth year of age, of a sanguineo-athletic temperament, appear to be most liable to fever of this vehement character. In early infancy, and in old age, simple inflammatory fever is not so often found to occur as during the intermediate periods of life.

Causes.—The exciting causes of inflammatory fever are very various. This grade of fever may be produced by cold, atmospheric vicissitudes, high solar heat, the intemperate use of spirituous liquors, too free an indulgence in high seasoned and irritating articles of food, the sudden suppression of natural or habitual evacuations, excessive corporeal exertions, a draught of cold water when the body is heated by exercise, violent passions, mechanical injuries, &c.

Of all these causes of synochal fever, however, *cold* is by far the most common. It is from the extensive influence of this febrific cause that continued fevers of a synochal grade are so common in cold and variable climates, and during the cold and changeable months of spring and autumn in the temperate latitudes. During the summer months we seldom meet with general fevers of a very phlogistic character; and pure synochal fevers are perhaps still less common in the intertropical climates. Prevailing northwest and northeast winds are particularly favorable to the occurrence of inflammatory fevers. So remarkably is this the case, that typhus fevers will sometimes assume, for a time, a decidedly phlogistic character, if the wind shift suddenly from a southern to a northern point. May not the *electric* changes of the atmosphere have some agency in the production of this effect? From the influence which atmospheric vicissitudes and sudden variations in the direction of prevailing winds are sometimes found to have on patients and convalescents confined in close chambers, or even in bed, this supposition does not seem to be improbable. There are, indeed, some writers who contend that a superabundance of electricity in the atmosphere constitutes the cause of epidemic inflammatory fevers. Hopf observes, that fevers of this kind are always most apt to prevail during those seasons and meteorological conditions, when the atmosphere is most charged with the electric fluid. Reil thinks that electricity often contributes considerably to the production of phlogistic fevers by increasing the general irritability of the system.*

* Hopf, Dissertat. sistens rudimenta theor. de principio febres inflam. epidemica gignente.

It may be observed, however, that the grade or modification of a fever does not depend so much on the character of the *remote* or *exciting cause*, as upon the peculiar condition of the *animal system* at the time the cause exerts its morbific influence. Thus, the same degree of cold may produce a low or typhoid fever in one, and a vehement inflammatory fever in another individual—a circumstance which proves unequivocally that such diversities depend mainly, and often wholly, on the peculiar predisposing condition of the body itself.

If of two individuals seized with fever from the same atmospheric vicissitude, one be especially prone to inflammation of the brain or of the mucous membrane of the alimentary canal, and the other to inflammation of the fibrous and serous structures, or be wholly free from any local predispositions of this kind, the fever will most probably early assume a low or typhoid grade of vascular reaction in the first, whilst in the latter it will be apt to retain its vigorous synochal character throughout its course.

When speaking of the general character and etiology of fever, I observed that in simple inflammatory or synochal fever, the principal febrific irritation is, probably, located in the vascular system—that is, in the internal membrane of the heart, arteries, and capillaries. In those general inflammatory fevers which arise from the influence of cold, at least, this is probably the case; for, in instances of this kind, besides the internal congestions and inequilibrium of excitement resulting directly from the impressions of this cause, a large proportion of the recrementitious elements of perspirable matter must remain mingled with the blood, (unless speedily removed by the vicarious action of some other emunctory,) and necessarily impart to this fluid qualities which are not natural to it. Most assuredly the retention of materials which have become useless to the system, and for whose constant elimination nature has provided so extensive a series of emunctories as the cutaneous exhalents, cannot be long tolerated by the animal economy with entire impunity. The blood is the natural stimulant of the sanguiferous vessels, and we must believe that its stimulating qualities are naturally in due and harmonious relation with the sensibility and irritability of its appropriate vessels. When, therefore, in consequence of suppressed perspiration, this fluid becomes surcharged with the elements of recrementitious perspirable matter, its natural relations with the heart, arteries, and capillaries will be destroyed, and irritation more or less intense must almost necessarily ensue. Why such a cause should produce typhoid fever in one, synochus in another, and pure synocha in a third individual, we may not be able to ascertain; but the grade of fever is, no doubt, determined by the particular condition of the system in relation to accidental or habitual debility, local disorder or predisposition, temperament, modes of living—in short, everything which constitutes a deviation from perfect health.

That the degree in which the sensorium commune becomes implicated, has an important share in determining the grade of febrile reaction, has already been observed in several places. It would, indeed, seem very reasonable to conclude, that as the powers of the system depend mainly on the regular supply of the nervous influence, the more the brain, its fountain, becomes involved in disease, the feebler will be the powers of the vascular and muscular systems. All low or typhoid fevers, in truth, are characterized by early and conspicuous manifestations of cerebral disturbance, and the prostration and encephalic disorder generally increase, *pari passu*. In fevers of the synochal grade, on the contrary, the brain and nerves suffer but little; and, when inflammation of the brain does supervene, the system and vascular reaction soon sink to a lower grade.

The prognosis in simple inflammatory fever is, in general, favorable. This, indeed, may be regarded as the least dangerous of all the varieties of continued fever, so long as it retains its simple form. When local inflammation super-

Reil, über die erkentniss und kur dur Fieber. Band. i. s. 501. See also Gautier's work, entitled Commentatio medica de irritabilitatis notione, natura et morb. p. 21.

venes, the danger will be more or less increased, according to the importance of the organ or structure in which the inflammation occurs, or the variety and force of its sympathetic connections, and according also to the intensity of the inflammation. When the breathing is free, and without cough or pain in the chest, and the abdomen neither tender nor tense to the touch, we may conclude that the fever is not of a dangerous character, from the almost certain absence of thoracic and abdominal inflammations. Slight delirium during the exacerbations is not to be considered as a very unfavorable symptom; when it becomes very violent, however, it betokens encephalic inflammation, and of course is indicative of greatly increased danger. Richter says that a very profuse discharge of limpid urine occurring suddenly, liquid or watery discharges from the bowels, and very copious sweats without sedimentous urine and abatement of the symptoms, constitute very unfavorable signs in synochal fever.

The signs which announce a favorable change are, the occurrence of slight hemorrhage from the nose, general perspiration, attended with pale urine, becoming turbid when cool, and diminution in the frequency, hardness and activity of the pulse, and in the febrile temperature of the surface.

Sect. II.—*The Synochus grade of Idiopathic Fever. Common Continued Synochus Fever (Synochus Simplex).*

The ordinary continued fevers, those which are most frequently encountered in practice, though phlogistic in their character, do not manifest that intense grade of inflammatory excitement and permanency of vital resistance which characterize the variety of fever described in the preceding section. In the simple continued fevers which form the subject of the present section, there exists, as in pure synocha, strong febrile reaction; but the vital powers are not sufficiently sustained to enable them to maintain this elevated and energetic grade of morbid excitement; and hence, although the fever may commence with a degree of vascular reaction and general strength differing but very little from synocha, yet both the grade of febrile excitement and the general powers of life will soon decrease conspicuously, and verge to the low or typhoid state.

The principal sources of this modification of continued fever, are *cold* or atmospheric vicissitudes and irritation or disorder of the alimentary canal and of the biliary organs. *Cold*, however, is decidedly the most common source of the ordinary continued fevers of the temperate and more northern latitudes. When the disease arises from this cause, it is generally more phlogistic in its early periods than when it occurs as the consequence of gastro-intestinal disorder or other febrific circumstances. The *status gastricus* of the German pathologists is, nevertheless, almost invariably present in every modification of continued fever of the synochus grade. An early occurrence of nausea, vomiting, foul tongue and disagreeable gastric sensations, are among the most frequent symptoms of common continued fevers. In this respect common continued fever of the synochus grade differs from synocha or pure inflammatory fever; the latter being but rarely attended by very manifest signs of gastric disturbance.

Simple continued synochus fever occurs under various modifications, many of which have been described by authors as distinct varieties of fever. The ordinary continued fevers of our cold and variable seasons, depending on the febrific influence of low temperature or sudden atmospheric vicissitudes, occur under various grades of violence, from the simple febrile state called a cold, to the most aggravated fever tending rapidly to cerebral oppression and fatal collapse.

In the mildest modification, a slight and transient feeling of chilliness is succeeded by a moderate increase of heat on the surface, a white tongue, some increase in the frequency, quickness, and fullness of the pulse, corporeal and mental languor, dryness of the skin, more or less pain over the eyebrows, a red and slightly diminished urine, slowness of the bowels and disturbed sleep. In

some instances the appetite is but little impaired, but most commonly it is suppressed. This grade of fever generally passes off in a few days, under a gentle perspiration or moderate diarrhœa.

The modification, however, which is especially designated by the name of common continued fever, is by no means so mild in its symptoms or so transient in its duration, and may be considered, in its more aggravated character, as one of the most formidable of general febrile maladies. This modification of the disease is generally ushered in by a distinct cold stage, characterized by great lassitude, restlessness, a feeling of tension and confusion in the brain, oppressed and anxious breathing, feebleness and quickness of pulse, a clammy tongue, disgust for food, flatulency and frequently nausea, retching, or vomiting. This stage, alternating towards its conclusion with flushes of heat, often continues for many hours before the stage of excitement is fully developed. The skin now becomes hot, dry, and suffused with a uniform but slight tint of red; the pulse more frequent, full and active, the face flushed; a dull, heavy or throbbing pain is experienced in the head; the patient is restless, morose, or peevish, and feels unable to fix his attention or to exert his mental faculties; his tongue is at first white, becoming dry, harsh, and dark-brown as the disease advances; the urine is generally red, sometimes pale, and wholly without sediment; the bowels are torpid, and the alvine discharges soft and often of a clay-colored appearance. There is generally, from the beginning, some degree of intolerance of light and sound, and the carotids and temporal arteries usually beat strongly. These symptoms commonly go on for five or six days without any material changes, except the slight remissions and exacerbations which occur in the morning and during the night. Slight delirium commonly occurs during the night for the first five or six days; as the disease continues, however, the symptoms of cerebral disorder become more and more conspicuous, so that by the eighth or ninth day it arrives at its acmé, and either gradually declines under a favorable crisis, or passes more or less rapidly into a *typhous* condition or *collapse*, attended with almost constant delirium, partial stupor, dilated pupils, dry, foul and dark-brown tongue, sordes about the teeth, hurried breathing, subsultus tendinum, picking at the bed-clothes; the pulse becoming progressively weaker, smaller and more frequent, and the vital energies sinking more and more until death takes place about the fifteenth, or perhaps the seventeenth day, and sometimes not until a later period.

In some instances of common continued fever, the symptoms of cerebral irritation are considerable at an early period of the disease, and the nervous or *typhous* stage supervenes rapidly and under a highly aggravated train of phenomena. With the development of the stage of excitement, which comes on slowly after a protracted and oppressive cold stage, strong manifestations of a cerebral disorder ensue. The patient evinces great aversion to light and sound; he is tormented by uninterrupted watchfulness; his mind is greatly confused; delirium comes on early, and soon becomes continuous and often violent; the countenance is flushed; the carotids beat strongly; the vital and voluntary powers are oppressed; the skin is intensely hot; the whole surface of the body is frequently tender or sore to the touch, and transient darting pains are often experienced in various parts of the body. "An extreme irritability of the nervous system attends the development of the fever; the arms are tossed to and fro on the bed; the head is moved from side to side, and the position of the lower extremities frequently changed."* Flatulency and irritability of the stomach, with more or less of tenderness to pressure in the epigastrium, are rarely absent. The pulse is at first frequent and active, but seldom very firm or tense. The *typhous* state generally comes on as early as the fourth or fifth day, and in some instances much sooner. When this happens, the pulse becomes smaller and more frequent; the previous high delirium passes into a low muttering raving,

* Armstrong on Typhus. American edition, p. 236.

and, finally, into a completely oppressed state of the sensorium, tending rapidly to a general prostration of the vital powers. The patient now lies on his back; moans, with his mouth open, and the eyes turned up under the lids. The retina seems insensible to light; one eye appears smaller than the other, from paralysis of one of the upper lids; the muscles of the face are variously agitated; the pulse becomes extremely rapid and small; and a clammy but warm sweat breaks out. The extremities finally become cold, the urine and feces are discharged involuntarily, and life ceases either gradually or suddenly in a paroxysm of convulsions.

Dr. Armstrong very truly observes, that in this latter and aggravated modification of the disease, acute or subacute inflammation of the brain is unequivocally present "soon after the full emergement of the fever." He has not, however, paid sufficient attention to the same condition of the alimentary canal. In the early period, and even before the stage of excitement ensues, nausea, retching or vomiting, total disgust for food, and various other disagreeable sensations in the abdomen are scarcely ever absent; and in the more advanced stages, tenderness or soreness on abdominal pressure, a tympanitic state of the bowels, a foul tongue, with red edges, indicate with sufficient certainty the presence of gastro-intestinal phlogosis. In some cases, subacute inflammation is developed in the respiratory passages, and occasionally also in other parts of the body, according to the accidental local predispositions which may exist.

There are some other modifications of continued fever of the synochus grade, which it will be proper to notice in this place. When cold acts on a system which has been previously much under the influence of *koino-miasmata*, it will sometimes give rise to continued fevers of a manifestly bilious, or what has been called gastric character. Lassitude, a feeling of weight, tension, and dull pain in the head, depraved or obliterated appetite, acid or bitter eructations, a sense of fullness and weight in the stomach and right hypochondrium, a sallow or icterode countenance, a gloomy taciturn disposition of the mind, transient pains in the abdomen, constipation, or bilious diarrhœa, with occasional slight creeping chills, are the phenomena which usually usher in the febrile attack. The heat of the skin rarely becomes very intense; the pulse is full, wavering, active, but very compressible, and seldom above 112 during the first few days of the fever; the tunica albuginea is tinged with bile, and in the progress of the disease a more or less icterode hue extends over the whole surface of the body. The skin is frequently moist about the heart and breast, but general or uniform perspiration hardly ever occurs before the resolution of the fever. The tongue is bitter, and covered with a thick yellowish slime, generally moist at first, but dry, rough, and dark brown in the latter stage of the malady. The urine is highly charged with bile and small in quantity. Nausea, retching and vomiting always occur, and the patient loathes all kinds of food; the desire for cool and acidulated drinks is generally urgent. The breathing is oppressed, and a short humid cough usually attends; its course is seldom very protracted, but its tendency to the *typhous* state is almost always exhibited at an early period, and unless the disease be mild, or speedily subdued, delirium, with the whole train of nervous symptoms mentioned above, and great prostration supervene by the fifth, seventh, or, at farthest the ninth day. The remissions and exacerbations are always very conspicuous.

There is still another modification of continued fever of the synochus grade, which arises from the united influence of a damp and cold air, deficient, innutritious, depraved and aqueous diet, mental depression, &c. The premonitory stage is long, but the fever itself varies in duration from five or six days to so many weeks. The pulse is often nearly natural in point of fullness and activity, but generally somewhat accelerated; the thirst is moderate, the appetite weak or entirely lost; the patient is torpid and drowsy; and the eyes are dull and watery; nausea frequently occurs, particularly in the morning; the heat of the surface is considerable; the tongue is white, slimy, and the taste is flat; the urine is pale, crude, and moderate in quantity, and generally surcharged with mucus. As the disease advances, the pulse becomes weaker, smaller, and more frequent; deli-

rium of a low muttering kind ensues, with hiccough, subsultus tendinum, and at last coma. The fever does not, however, always run into the nervous state. In some instances a general diaphoresis, and a mucous deposit in the urine, occur about the seventh or ninth day, and leads to a slow convalescence. There is generally more or less tenderness in the abdomen.

All the foregoing modifications of continued fevers, but more especially the second, have been confounded with genuine typhus. Dr. Armstrong has pointed out the distinctive characteristics of these maladies, and though he has since changed his sentiments with regard to the etiology and essential nature of typhus, the diagnosis which he has given between these two diseases is nevertheless founded, I think, on sound positions.

In typhus, the sensorial functions are earlier and more invariably disturbed, and the muscular prostration is greater than in the most common forms of continued fever. Mental depression or despondency, a sullen gloom of the countenance, and an almost insurmountable apathy and disinclination to mental and corporeal exertion, are remarkably characteristic of typhus, and never very conspicuously present in simple continued fever of the synochus grade. "In common continued fever, the patient generally has not much inaptitude of mind, often answers questions readily, and in a pretty firm voice, without much increased agitation of the breathing; whereas, in typhus, the answers are mostly given with languid slowness and reluctance, and much speaking obviously disturbs respiration. In common continued fever, the skin is usually of a brighter red than natural; whilst in genuine typhus it is always more or less of a *dusky, dingy* color. In typhus it has an early tendency to become brown and dry; in the common continued fever it is always white, and often somewhat moist for the first week."* To these may be added the slight exanthematous efflorescence about the fourth day of the stage of excitement in typhus,† which is never seen in common continued synochus; and the very peculiar smell‡ which exhales from the bodies of typhus patients, and which occurs in no other malady.

When common continued fever of the synochus grade remains simple or uncomplicated with manifest local inflammation, it rarely assumes a low or a very dangerous character. Instances, however, do sometimes occur, which *apparently*, without any local inflammation, continue under no very violent train of symptoms until the vital powers gradually yield, and the system sinks into a state of great debility and nervous mobility. These cases are generally prolonged to the fifth, sixth, and even eighth week. The tendency of all febrile diseases, however, is to produce inflammation in some part or other of the system; and in few diseases, perhaps, is this tendency more strongly expressed than in the more violent cases of the present form of fever. Although it cannot be maintained that local inflammation invariably pre-exists as the only immediate cause of that group of phenomena we term *fever*, it must nevertheless be admitted, that, as an *effect*, more or less of local inflammation is much more commonly present in febrile diseases than was formerly, and by many is still supposed. In common continued fever from cold, encephalic inflammation is by no means a rare occurrence. In the more violent and rapid instances of the disease, where continued delirium, at first furious and then low and muttering, occurs, cerebral inflammation is, no doubt, always present. In nearly all those who die of this form of fever, the brain and its meninges exhibit marks of previous inflammation, such as effusion of serum into the ventricles and on the surface of the brain, great vascularity of its membranes, redness, vascular turgescence, flakes of effused lymph, &c.

Gastro-enteric inflammation, also, is a common occurrence in the severer instances of this variety of fever. Tenderness of the abdomen to pressure—a con-

* Armstrong on Typhus, p. 261, first American edition.
† Hildebrand on Contagious Typhus.
‡ An Essay on Typhus Fever, by Nathan Smith, M. D., p. 26.

stant disposition to lie on the back with the knees drawn up—a red and raw aspect of the edges and tip of the tongue ; intestinal tympanitis, accompanied with low muttering delirium, are phenomena very frequently met with in the advanced stage of synochus fever—phenomena which give unequivocal evidence of the presence of inflammation in the alimentary canal. In many cases, both the brain and mucous membrane of the intestinal tube are inflamed; and this concomitance of cerebral and intestinal inflammation renders the disease in the highest degree unmanageable and dangerous. Not unfrequently, however, the brain is the only organ which suffers inflammation. When the cerebral affection is unaccompanied by gastro-intestinal inflammation, the patient seldom sinks so rapidly into the typhoid state as when the fever is attended by both these local affections. Great prostration and conspicuous typhous symptoms, in common continued fever, are almost always associated with the above-named signs of gastro-enteric inflammation.

The mucous membrane of the respiratory organs, too, generally suffers irritation or some degree of inflammation. More or less cough occurs in the majority of cases ; and in some instances the pectoral oppression and difficulty of respiration from this cause become a prominent and serious affection.

Prognosis.—When symptoms of local inflammation do not supervene, the disease generally yields to a moderately antiphlogistic treatment, and terminates favorably under a critical diaphoresis within the first two weeks. Early and violent symptoms of cerebral disorder are indicative of much danger. Continued, low muttering delirium, picking at the bed-clothes, paralysis of one or both of the upper eyelids, continued agitation and distortion of the muscles of the face, eyes turned up under the lids, &c., betoken cerebral inflammation, and the utmost degree of danger.

Great muscular prostration—constant position on the back—a small, extremely frequent and weak pulse, denote a state of collapse, from which recovery is extremely rare, especially when connected, as it almost invariably is, with manifestations of local inflammation. Tenderness in the abdomen—a gurgling noise when fluids are swallowed—tympanitis, liquid and unnatural alvine discharges in the early periods of the disease, are always indicative of great danger.

Treatment.—In the treatment of simple continued fever, whether of the synocha or synochus grade of febrile excitement, we have the following general *indications* to direct us in our remedial efforts. 1. To diminish the general momentum of the circulation. 2. To restore the natural actions of the various secretory organs—above all, those of the skin, liver, and kidneys. 3. To equalize the circulation and obviate local determinations. 4. To remove from and out of the system, as far as may be practicable, everything which has a tendency to irritate or unduly excite the system.

Of these general indications, the *first* is, undoubtedly, of paramount importance, and should, therefore, always receive the earliest attention in fevers of high vascular excitement. This is, more especially, requisite in pure inflammatory or synochal fever; for here almost everything depends on the speedy reduction of the excessive arterial reaction. *Blood-letting* stands at the head of our means for reducing vascular action, or inordinate momentum of the circulation. Whatever may be the immediate cause of the increased action of the heart and arteries, there can be no safe measure which will so speedily and effectually diminish its violence as the abstraction of a portion of the circulating fluid. In order to obtain the full advantages which blood-letting is capable of affording in febrile diseases, it ought to be employed to the extent of producing a decisive impression on the system in the *early* period of the malady. Blood may, indeed, be drawn with benefit at any period of the disease, provided the pulse be active, quick, dense or hard ; but one decisive bleeding soon after the febrile excitement is developed, will generally do more towards subduing the violence, or shortening the duration of the malady, than a much greater quantity of blood taken away at four or five less efficient bleedings practised at intervals throughout its course.

In truth, the benefit derived from blood-letting does not depend so much on the *quantity* of blood abstracted, as upon the degree of impression made on the system by the evacuation; and hence, 20 ounces taken at once will often do more good than double this quantity taken in small but repeated bleedings. "In venesection for the relief of an inflammatory affection, our object is not simply to diminish the quantity of the blood, but also to diminish the action of the heart and arteries; and it may be affirmed that twelve ounces of blood drawn from a large orifice so rapidly as to produce an immediate and decided effect on the pulse, will prove much more useful than a considerably larger quantity taken so slowly that the heart has time to accommodate itself to the loss," and thus to resist the subduing influence of this measure.*

It is certainly a good rule in practice to accomplish our intentions with as little expenditure of the resources of the system as possible. In all inflammatory affections, therefore, the blood ought to be drawn in a full stream and from a large orifice, and suffered to flow until its influence on the system is unequivocally manifested in the subdued action of the heart and arteries, and the feelings of approaching syncope. This rule is particularly important in the acute phlegmasial affections. By taking away the blood in this manner, we obtain a more decisive and permanent reduction of the phlogistic excitement, and with a *smaller expenditure of the blood*, than when the evacuation is less rapidly and efficiently made; since in this latter case it must generally be frequently repeated before the desired reduction of the vascular reaction is effected. There is another circumstance which renders very efficient blood-letting in the onset of febrile diseases preferable to less decisive but repeated abstractions of blood. However much the system may be subdued by a copious bleeding in the commencement of a fever, the vital energies soon rally sufficiently to prevent dangerous prostration from this measure; but when the blood, though not copiously at a time, is *frequently* drawn, it happens, sometimes, that at last the system is suddenly prostrated into a state of collapse, out of which the most potent stimulants will hardly suffice to raise the patient. I remember, with pain, the unfortunate lot of an amiable and intelligent friend. He was a man of a healthy constitution, and fond of indulging in the pleasures of the table. He was seized with a simple synochal fever from cold. His physician bled moderately; the fever went on unchecked; he bled again and again daily; after the seventh bleeding there was still too much quickness and tension in the pulse; the lancet was inserted the *eighth* time, and the patient almost immediately sunk into a state of collapse. Stimulants, both external and internal, the most diffusive and potent, were now diligently applied, but all in vain; he lived but a few hours longer.

In fevers of the *synochal* or highly phlogistic grade, almost everything depends on the speedy reduction of the excessive vascular excitement. Prompt and decisive blood-letting is indispensable in fevers of this kind. In the ordinary continued fevers of a less vigorous character, or the *synochus* grade where local inflammation has not already supervened, it is not often necessary to draw much blood. One or two bleedings, to the extent of making an evident impression on the system, will generally moderate the arterial action sufficiently; and in the milder instances of the disease, blood-letting may sometimes be wholly dispensed with. As the principal danger, however, in fevers of this kind, depends on the supervention of local inflammation, and as this is by no means an uncommon occurrence, even in fevers which at first appear to be mild, it is always best to moderate the general momentum of the circulation at once, by an adequate bleeding in the commencement, in order to lessen, as much as may be in our power, the liability to visceral inflammation. In the treatment of every form of fever, the prevention, or the speedy removal of local inflammation, constitutes a chief object of remedial attention; and there is no general remedy which answers this object more directly than the judicious employment of the lancet.

* Scudamore on the Blood.

In the employment of blood-letting the pulse must be our principal guide. The quantity and frequency of the bleedings must be regulated chiefly by the state of the pulse, and particularly by the effects produced on it by the evacuation. There are, however, various other circumstances, which it is of much importance to bring into view, in the judicious management of this remedy. The temperament of the patient, the age, sex, constitutional predisposition, mode of living, climate, habits, &c., all claim especial attention. A native of an intertropical country will, *cæteris paribus*, rarely bear the same extent of depletion as an inhabitant of a northern climate. Persons of a nervous or relaxed habit of body, sink much sooner from the loss of blood than the sanguineous and athletic. In very old people we must proceed with more caution in the use of the lancet than in the youthful and middle-aged; nor can we in general take as much blood without detriment from the luxurious, indolent, and intemperate, as from the vigorous, active, laborious, and temperate.

The inflammatory or buffy coat of the blood may, in general, be regarded as an indication for the further employment of the lancet. It is not, however, to be implicitly relied on as a guide in this respect. In rheumatic fever, for instance, the blood will often continue to exhibit the buff after bleeding has been practised to the utmost allowable extent. Nor are we to regard the disappearance of this phenomenon after several bleedings, as an objection to the further use of the lancet, if the pulse continues to indicate its propriety.

A hard, tense, or quick and corded pulse, will always justify the use of the lancet, whatever may be the general character of the disease, or at whatever period of its course it may occur. In the commencement or early period of the disease, the blood should be suffered to flow until a strong impression is made on the system; but when bleeding is practised at an advanced stage of the fever, it will, in general, be most prudent to carry it to the extent of producing only a slight effect on the pulse, as a very decided impression might readily precipitate the system into a fatal collapse, or at least dangerous prostration.

As the bowels are almost invariably more or less constipated in the varieties of fever under consideration, and liable, therefore, to irritation from this source, they ought always to be early evacuated by suitable purgatives. Without doubt, the secretions which flow into the intestinal canal, in every variety of fever, become additional sources of irritation when suffered to accumulate; and hence, simply with the view of removing these accidental supporters of febrile excitement, *purgatives* are important remedies throughout the whole course of acute diseases. In synochal and the common continued fevers, however, purgatives are beneficial, not only by evacuating the irritating contents of the bowels, but in some degree also by their depletory and revulsive effects. The choice of the purgatives is by no means a matter of indifference in the treatment of the present variety of fevers. The saline purgatives are generally preferable on account of the usual mildness of their operation, and their tendency to allay febrile excitement, by their general refrigerant influence, independently of their evacuant effects. The sulphates of soda and magnesia are excellent aperients in fevers of a highly phlogistic character. They may be administered with peculiar advantage, according to the following formula:

℞.—Sulphat. sodæ vel magnes. ℥ii.
Tart. antimon gr. i.
Solve in aquæ fontanæ ℥x. M. ft. Of this solution a wineglassful may be taken every hour, until purging is produced.

In the commencement of the fever, when there is reason to apprehend the early occurrence of serious cerebral affection, a mixture of jalap and cream of tartar is an excellent purgative. Twenty grains of the former, with two scruples of the latter article, may be administered for this purpose. This mixture generally causes very copious serous stools, and thus acts at once as a strong revulsive upon the brain, and as an active depletory measure.

In those cases of continued fever which are attended with manifest derangement of the biliary organs, six or eight grains of *calomel* should be exhibited a few hours before the saline purgative is administered. *Cremor tartar* dissolved in tamarind water, or the Seidlitz powders, constitute very excellent laxatives in inflammatory fevers, after the bowels have been once well evacuated by a more active purge.

Useful, however, as purgatives most certainly are, in fevers of the character now under consideration, they may, nevertheless be as readily abused in the present, as in other forms of fever. Harsh, drastic, or very frequently repeated catharsis, seldom fails to do much injury by exciting great irritation or subacute inflammation in the mucous membrane of the alimentary canal, and, perhaps, also in some degree, by disturbing the natural tendency of these fevers to terminate by a critical discharge from the cutaneous exhalents. After the first purge, which ought to be sufficiently active to evacuate the bowels well, the milder laxatives alone should be employed in such a way as to procure two or three gentle evacuations daily. These observations are made in reference to simple or general inflammatory or synochus fever; for, in many of the most dangerous *phlegmasial* diseases, *very active* purgatives are often decidedly beneficial by their revulsive effects, as well as by their tendency to moderate general febrile excitement. Thus, in arachnitis, in peritonitis, in acute ophthalmia, &c., active cathartics often contribute very materially to the reduction of the malady.

Diaphoretics are well calculated to do good in fevers of a high grade of excitement. Torpor of the cutaneous exhalents is generally the first link in the chain of morbid actions which take place in the development of these maladies, and continues often throughout the greater part of their course, unless overcome by the employment of suitable diaphoretics. In vain will we look for the subsidence of such a fever, so long as this important emunctory remains inactive. The benefits which accrue from this class of remedies are, however, by no means proportionate to the copiousness of the evacuation they produce; for in almost every variety of continued fever, much more advantage usually results from a moderate and uniformly diffused diaphoresis, than from very profuse sweating. In the early period of inflammatory fever, it is generally extremely difficult, and often impossible, to procure more than a very partial and transient diaphoresis. Nevertheless, the remedies which are commonly employed to produce diaphoresis, possess the power of moderating febrile excitement, independent, apparently, of any evacuant effect; and hence, although we may fail in procuring an adequate discharge by the skin, considerable benefit will generally arise from the early and regular employment of such medicines. *Nitre*, which is one of our most valuable *diaphoretics* in inflammatory fevers, manifests also no inconsiderable power in reducing the general phlogistic condition of the system. The same is still more conspicuously the case with *antimony*, and these two articles are accordingly almost universally employed in fevers of a phlogistic diathesis. *Nitre* and *tart. antimonii* are usually administered in combination, in doses of from ten to fifteen grains of the former, to one-eighth or one-tenth of the latter, every two or three hours. This combination, however, sometimes acts strongly on the bowels, and gives rise to irritation, tormina, and frequent watery stools. Such effects tend greatly to increase the violence and danger of the disease, and must be speedily counteracted by mucilaginous drinks, and minute doses of calomel and ipecacuanha. Thus:

R.—Calomel gr. i.
Pulv. ipecac. grs. vii.—M. Divide into eight equal parts, of which one is to be taken every half hour or hour.

This combination, when aided by mucilaginous diluents, seldom fails to subdue the gastro-intestinal irritation produced by irritating remedies or other offensive ingesta. This is a point to which great attention should be constantly paid. The exhibition of nitre and antimony or cathartics, after the effects just mentioned

occur, is exceedingly improper, as it must almost inevitably increase the violence and dangerousness of the malady. It should always be recollected that the chief danger in fevers of this kind arises from the local inflammations which are so apt to occur; and our main object should be to prevent the occurrence of inflammation, or to subdue it as speedily as possible.

I have usually preferred administering the *nitre* and *tart. antimonii*, according to this formula, as being much less apt, I think, to irritate the stomach and bowels, than when given in the form of a powder:

℞.—Nitrat. potassæ ʒij.
Tart. antimonii gr. i.
P. extract. glycyrrh. ʒij.
Mucilag. g. Arab. ℥ss.
Aquæ fœniculi.
Aq. fontanæ ää ʒiv.—M. ft. Dose—a tablespoonful every hour or two.

Cullen was of opinion that the antiphlogistic effect of tart. antimonii depends on the *nausea*, and consequent relaxation which it produces when taken in full doses; but this opinion has not been confirmed by experience; it being now very generally admitted that it possesses a sedative or contra-stimulant power, wholly independent either of an evacuant or nauseating effect. Of late this article has been much employed by Rasori and his followers as a contra-stimulant, in what may well be called enormous doses. It is asserted that when given in large and *frequent* doses, to the extent of from twenty to thirty grains daily, it rarely produces emesis, and often not even nausea, but greatly diminishes the action of the heart and arteries, and general as well as local inflammatory action. In Italy the most violent inflammatory fevers are treated, and according to the published reports, with success, by large and frequently repeated doses of this article, without any direct depletion whatever. Of this practice I can say nothing from my own experience. That it may be adequate to subdue inflammatory excitement can scarcely be doubted, but neither its safety nor its successfulness appears to me such as to warrant the relinquishment of *depletion*, with the usual antiphlogistic auxiliaries in favor of its exclusive employment. In small doses antimony is a safe and an important medicine in the treatment of inflammatory fevers. From one-eighth to one-tenth of a grain every hour or two, will generally contribute materially to the reduction of febrile reaction, and rarely fail ultimately to excite the cutaneous emunctories. I have been led to believe that the diaphoretic and antiphlogistic effects of this antimonial are more certainly and conspicuously displayed when administered in a considerable portion of some bland nutritive or mucilaginous fluid, than when given in the form of powder, or an ordinary aqueous solution. One grain of tart. antimonii may be dissolved in a pint of barley water, and drank in the course of four or five hours. Antimony must be used very cautiously, however, in cases attended with symptoms of gastric irritability or irritation. Its salutary powers are most conspicuously displayed in the pure synochal fevers, although more or less benefit may be derived from its judicious employment in every modification of fever attended with an increased momentum of the circulation, and a dry and preternaturally warm skin.

James's powder, in small and repeated doses, is also an excellent antiphlogistic diaphoretic, in fevers of this kind. It may be given by itself, or in union with nitre, in doses of half a grain of the former with twelve grains of the latter, every two hours. Of all the sedative diaphoretic remedies I have yet employed, the most powerful is a liquid antimonial preparation, somewhat similar to the old diaphoretic antimony in its composition, prepared by Mr. Edward Evans, an apothecary of this city. This preparation is but little known, although, from what I have frequently witnessed of its effects, I am fully satisfied that it is a peculiarly valuable remedy. Mr. Evans is the only person in this country who prepares this antimonial remedy, and no measures whatever have been taken by him, or by any one else, to bring it into notice.

Digitalis in small and frequent doses, either alone or in combination with

nitre, will sometimes aid considerably in reducing excessive vascular action. From a quarter to half a grain, administered every two hours, rarely fails to make some impression on the pulse, in the course of forty-eight hours. It is particularly appropriate in those instances where, after due depletion and catharsis, the pulse remains quick, somewhat active and frequent, and where it may be doubted whether more blood may yet be prudently abstracted.

Mercury is not applicable to the treatment of simple *inflammatory* fever. In common continued fevers of a less violent grade, especially in instances attended with biliary disorders, and in cases which become complicated in their course with subacute visceral inflammation, the mercurial influence will frequently afford important advantages. In no case, however, ought mercury to be administered with a view to its constitutional influence, before the general momentum of the circulation has been considerably diminished by bleeding and purging. Where opportune and moderate evacuations, together with blisters, fail to arrest cases of common continued fever, attended with *subacute* inflammation, "calomel," says Dr. Armstrong, "should be given as a salivant. On numerous occasions," he affirms, "I have seen an evident improvement in visceral inflammations from the time that ptyalism took place. I must again observe, however, that mercury is salutary only in those modifications of continued fever, where the general powers of the system and the action of the heart and arteries evince a tendency to a moderate grade of febrile excitement. Where the vital resistance and actions are vigorous, or where very acute and rapid visceral inflammation is present, nothing but the most prompt and efficient employment of the lancet can afford any reasonable hopes of success. In most instances of common continued fevers, however, there exists a radical tendency to a typhoid state, and the inflammations which arise are usually of a slow or subacute character. In such cases mercury may be accounted as among our most useful remedies, when preceded by proper depletory measures. It must also be observed that mercury can be usefully employed only in the early periods of the disease, anterior to the approach of collapse or cerebral oppression. I have generally preferred giving the calomel in two grain doses, with a few grains of ipecacuanha, every four or five hours, until the gums become slightly affected. I have often found the skin to become moist, the pulse softer and less active, and the symptoms generally to abate, as soon as the mercurial influence became perceptible in the gums.

There are various other general antiphlogistic remedies of minor importance, which may be occasionally resorted to with advantage in the fevers under consideration. When the disease is in a great measure subdued, and the pulse continues to be somewhat quick, sharp, and irritated, and the skin rather dry and hot, the following mixture will generally act very beneficially:

℞.—Spirit. mindereri ℥vi.
Spirit. nit. dulc. ℥iiss.
Vin. antimonii ℥iss.
Syrup. limonis ℥ij.
S. Dose, a tablespoonful every two or three hours.

In the early period of *simple* continued fever, when the skin is very hot and dry, considerable relief may be obtained from sponging the body with cool water. In fevers of a very high grade of excitement, a draught of cold water is not only always very grateful to the patient, but tends, moreover, to reduce, for a time, the excessive febrile heat, and to dispose to diaphoresis. In cases complicated with local inflammation, however, cold ablutions will rarely do good, and sometimes manifest harm. Cool acidulated drinks ought, indeed, to be freely allowed in synochal fever, so long as the skin remains dry. Lemonade, solutions of tamarinds, currant, blackberry or strawberry syrups, form very pleasant and useful beverages in febrile affections. When the surface is moist with perspiration, the drinks should be tepid. The mild diaphoretic infusions, such as elder-blossom tea, infusions of eupatorium perfoliatum, balm, marjoram, &c., together with spiritus mindereri, or spirit. nit. dulc., minute portions of tart. antim., or

the saline effervescing draught, are appropriate and useful remedies in the latter periods of the disease, when the febrile irritation is about declining under a gentle diaphoresis.

Although topical remedies are not particularly indicated in the treatment of *simple* or general fevers, yet as synochal and common continued fevers are apt to become complicated, during their progress, with visceral inflammation, local remedies often become indispensable to the safety of the patient. The brain and mucous membrane of the alimentary canal, are most frequently the seats of these secondary inflammations. In some instances, perhaps in the majority, both these structures become inflamed at once; in others, one of them alone suffers inflammation. The occurrence of cerebral inflammation in common continued fever is always an accident of the most alarming and dangerous character, and ought to be promptly and vigorously counteracted by every efficient means in our power. In the more violent cases of the disease, symptoms of approaching cerebral inflammation sometimes manifest themselves soon after the full development of the fever, but in most instances, the inflammation does not show itself until about the fifth or sixth day of the disease. Where there is reason to apprehend the occurrence of cerebral inflammation, or where it has actually commenced, blood should be at once drawn until syncope approaches, and one or two brisk cathartics administered. Topical bleeding by leeching, is generally especially recommended in such cases; but my own experience leads me to place much more reliance on cold applications to the bare scalp, with blisters on the back of the neck, and a few cups to the temples. As leeching, however, does not take up a great deal of time, nor prevent the use of these latter applications, it should undoubtedly be employed if leeches can be had. Whilst these applications are being made to the head, warm fomentations should be applied to the feet and legs, in order to cause as much revulsion from the brain as possible. It ought to be particularly kept in mind, that little or no benefit will be derived from any of these applications so long as the momentum of the general circulation remains preternaturally augmented. General blood-letting, to the extent of producing a very decided impression on the circulation, should always precede the employment of leeching, cupping, or blisters, in fevers of high vascular excitement. From this precept, however, we must except the application of *cold*, which, in cerebral inflammation especially, may be employed with great benefit, however vigorous the febrile action may be. The application of *ice* or *iced* water to the head, is, indeed, a very valuable remedy in fevers attended with cerebral inflammation. The hair should be cut off close to the scalp, and cold applications almost continually made to the head, at the same time that the circulation is solicited to the inferior extremities by warm or irritating applications to the feet.

The common practice in this country of applying blisters to the scalp is of very doubtful efficacy. From much attention to this subject I am satisfied that little or no benefit can be derived from the application of blisters to the top of the head in cases of cerebral inflammation.* Applied to the back of the neck, or between the shoulders, however, they will often assist materially in reducing encephalic inflammation, and should certainly never be neglected in such cases.

When the inflammation is seated in the alimentary canal, leeches, succeeded by a large blister, should be applied to the abdomen; and nothing but the bland-

* [This is no doubt true in the active or earlier stages of cerebral inflammation. But after extensive and protracted depletion, no remedy is more efficacious than blisters over the entire shaven scalp. I am confident that several lives have been saved under desperate circumstances by this remedy. I recollect one case where, on the seventh day of acute meningitis, after frequently repeated general and topical blood-letting and severe purgation, the delirium and intolerance of light and sound yielded to a large blister over the scalp, which was left on for nine entire days. This patient recovered without any relapse. In another case of acute hydrocephalus in a child attended with complete prostration, coma and dilated pupils, the same remedy, continued for several days, afforded unexpected and complete relief.—Mc.]

est mucilaginous drinks allowed, with occasional laxative enemata. The usefulness of cold applications is almost wholly confined to encephalic inflammation; for in *gastro-enteritis* they are wholly useless, and calculated rather to do mischief. Instead of cold, warm fomenting applications ought to be employed in this latter inflammation.

It should be observed that the mucous membrane of the intestines is frequently intensely inflamed without the patient complaining of any pain in the abdomen. Ignorant practitioners never think of inflammation unless they hear the patient complain of pain. I have known cases of continued synochus fever treated to within a few hours of their fatal termination without the slightest suspicion, in the mind of the physician, of the existence of intestinal inflammation, because no pain was complained of by the patient, although the abdomen was exceedingly tender to the touch, and the tip and edges of the tongue clean and florid.

In all cases of general fever, it is of the utmost consequence to attend carefully to the state of the internal organs, more especially to that of the gastro-intestinal mucous structure. Firm pressure should from time to time be made on different parts of the abdomen. If the patient complain of much tenderness or pain when pressure is made, there will be reason to apprehend the existence of inflammation; and if, in addition to this sign, the tip and edges of the tongue are red and clean, the presence of mucous inflammation of the bowels may be deemed certain. Frequently, on examination, the abdomen is found so tender that even slight pressure gives rise to the severest suffering, although, without pressure, the patient does not complain of any pain.

In examining the abdomen, care must be taken to press successively upon every part of the abdominal parietes. In some instances we may press firmly upon several parts without giving rise to much uneasiness until we come to the region over the inflamed portion of the bowels, where the slightest touch will cause the patient to flinch or cry out. Even when the patient is incapable of expressing his sensations, from being in a state of delirium or stupor, we may generally detect the presence of abdominal inflammation by watching the countenance while the pressure is made. If there is inflammation, the countenance immediately assumes the expression of pain and suffering on compressing the abdomen. During the whole course of the present variety of fevers, the strictest attention should be paid to the removal and exclusion of everything which is capable of irritating or unnecessarily exciting the system. In synochal or inflammatory fever, the chamber should be kept quiet, cool, and obscure; and besides the beverages already mentioned, and thin barley or toast water, no nourishment whatever should be allowed. This is a most important though very often much neglected requisite in the safe remedial management of fevers. The most judicious treatment, in other respects, is frequently rendered abortive by a want of proper dietetic regulations.

Tonics, or stimulants, are very rarely necessary during convalescence from inflammatory or common continued fever. They would, indeed, very generally prove prejudicial. For several days after the complete subsidence of the fever, the patient ought to refrain from solid animal food, and above all from high-seasoned articles of diet. Farinaceous liquids, and weak animal broths, taken in moderation, will in general be quite sufficient for the first four or five days of convalescence.

Sect. III.—*Typhus.*

There is, perhaps, no form of febrile disease, concerning which physicians have expressed a greater variety of conflicting opinions, than typhus fever. Long an object of the deepest interest and attention, it might well be presumed, that every circumstance calculated to illustrate its nature and remedial treatment, must have been abundantly noticed and accurately estimated. Whatever industry and

carefulness of observation may have been bestowed on this subject, the result has not been very flattering, for even at this day, there exists great discrepancy of opinion concerning many of the most important points of its pathology and treatment.

Without entering into a detail of the vague and arbitrary employment of the term typhus, in the writings of both ancient and modern physicians, it will be sufficient to state, in limine, that typhus is here regarded as a *peculiar* form of fever, capable of propagating itself by contagion—commencing often like synochus, and passing into a state, characterized by a stunned or torpid condition of the sensorial powers, with great prostration of strength and delirium.

Symptoms.—(Premonitory stage.)—A peculiar uneasy sensation in the pit of the stomach, want of appetite, slight giddiness and nausea, pale, shrunk, and dejected countenance, dull and heavy eyes, often tremor of the hands, and a general feeling of weariness, debility, and disinclination to mental and corporeal action. These premonitory symptoms usually continue from three to six days, terminating in those which mark the stage *of invasion*—viz: slight chills, alternating with flushes of heat; an entire disgust for every kind of food; tongue covered with a thin whitish fur; considerable nausea, and sometimes vomiting: a quick, small, and irregular pulse; a confused and heavy sensation in the head, and increased mental and physical depression. This stage generally occupies from six to twelve hours, and terminates in the stage of *excitement*. The febrile heat now increases considerably, the face is slightly flushed, the pulse rises in strength and fullness, the skin becomes dry, the lips parched, there is considerable thirst for cool drinks, the tongue becomes more furred and slimy, the bowels are usually torpid, the mind is more confused, the patient fretful, restless and watchful, with an anxious expression of the countenance, the urine is small in quantity and reddish, the head feels heavy, much confused, and vertiginous; during the first two days of this stage occasional manifestations of slight delirium occur during the night. About the end of the second, or during the third day of this stage, slight catarrhal symptoms usually supervene—such as suffused and injected eyes, moderately inflamed fauces, somewhat painful deglutition, more or less oppression in the chest, attended generally with a short dry cough. There are often some tension and tenderness in the hypochondria, more especially in the right one. (Hildebrand.) Pains in the back, loins and extremities, are rarely absent in this stage, and in most cases a general soreness is experienced throughout the whole body. Towards the close of the third day of the stage of excitement, there are usually much giddiness and sensorial obtuseness present; the patient appearing, even at this early period of the disease, as if under the influence of some narcotic. The cerebral functions now become more and more disturbed, hearing becomes obtuse, delirium more frequent and considerable, and the general torpor gradually increases. Hildebrand asserts that a peculiar miliary exantheme occurs on the surface about the fourth day of this stage which he considers as essential to the perfect and regular development of the disease. The same observation is made by Hartman.* One of the most striking characteristic phenomena of typhus is the almost insurmountable aversion to corporeal and intellectual exertion, manifested throughout nearly the whole course of the disease. The patient moves slowly, and, seemingly, with great reluctance, and his answers to questions are hesitating, short and peevish. The stage of excitement generally

* In those seasons when typhus prevails most epidemically, and very remarkably in the present (1827), it is very frequently attended by an eruption of the skin closely resembling what is seen in some of the contagious exanthemata, particularly measles. A majority of the cases treated by me in the hospitals during the present year had more or less of this eruption. It was most distinct and numerous in severe typhoid cases, but not confined to cases of any type. It was very irregular in its time of appearance and disappearance—seldom appearing, however, before the fourth or fifth day; sometimes not till the tenth or twelfth, in which last case, it was uniformly attended by an aggravation of the febrile symptoms.—*Dr. Alison on the Epidemic Fever of Edinburgh;* vide *Edin. Med. and Surg. Journ.*, vol. 28, p. 244.

continues about six or seven days, before it terminates in the stage of *collapse*, though this *sinking* stage sometimes supervenes at a much earlier period; and occasionally comes on a few days later. The occurrence of a collapse is manifested by the subsidence of the previous inflammatory symptoms, and the supervention of great prostration; feebleness and greater frequency of the pulse; a dry, brown, and eventually black tongue; teeth and prolabia incrusted with black sordes; a stunned, confused and deranged state of the sensorial functions, with more or less constant, low muttering delirium;* total apathy and indifference to surrounding objects; generally great difficulty of hearing; floccitacio, subsultus tendinum, twitching of the muscles of the face, great difficulty of protruding the tongue, constant recumbence on the back, and gradual sliding down towards the foot of the bed from deficient muscular power; a peculiar biting heat of the skin called *calor mordax*, and finally, in violent cases, dark spots or blotches on the surface, a deep guttural or sepulchral voice, hiccough, and a tympanitic state of the abdomen. Tenderness of the abdomen to pressure, is one of the most common symptoms, in the latter periods of typhus. (Hildebrand, Broussais.) During the collapse, the urine is rather copious, pale, and often foams like beer, when voided into a vessel; there is, generally, also a manifest tendency to diarrhœa in the latter periods of this stage, the discharges being watery, acrid, and highly offensive. Towards the termination of this stage, particularly when it tends to a fatal end, coma, more or less complete, is seldom absent, from which, however, the patient may usually be roused for a few moments. The period of collapse generally continues from seven to nine days, terminating either in slow convalescence or in death. The occurrence of convalescence is announced by the appearance of a gentle and uniform moisture on the skin, a reduction of the acrid heat of the surface, a moist tongue cleaning along the edges, more copious and sedimentous urine, abatement of the delirium, and short intervals of repose, and in some instances moderate diarrhœa. In some cases these phenomena of a favorable crisis do not take place until the seventeenth or even the twenty-first day, but in the majority of instances they occur about the thirteenth or fourteenth day of the disease. The progress of convalescence is generally tedious, and the debility both of body and mind, after the total subsidence of the fever, is always very considerable.

Such are the course and principal phenomena of simple typhus, in its regular progress. Deviations and various irregularities do, indeed, frequently occur, even in the simple form of the disease, but they are seldom such as to efface the peculiar character, or essential phenomena of the malady.

Typhus, however, is subject to certain prominent modifications, which, as they require corresponding changes in the mode of treatment, require particular notice. In some instances the disease is early attended with internal visceral inflammation, a complication which adds considerably to the rapidity and danger of the malady. This modification constitutes the inflammatory typhus of Armstrong. The typhoid pneumonia, so extensively and fatally prevalent throughout this country, in the years 1811, 1812, and 1813, was of this kind.

The brain, the lungs, the mucous membrane of the alimentary canal, the liver, and the peritoneum, are the parts most apt to become inflamed in typhus; and of these parts, the brain and intestinal tube are most frequently the seat of the inflammation. Most commonly, the phlegmasial symptoms do not supervene, until the second or third day of the stage of excitement, though occasionally the local affection manifests itself much earlier.

When the brain is inflamed there are generally deep and pulsating pain in the head; flushed countenance; throbbing of the carotids; redness and morbid sensibility of the eyes; irritability of temper; transient pains in the extremities;

* During the low and tranquil delirium of typhus, the mind is usually occupied and tormented by some one prominent idea or object. Hildebrand compares it to the mental workings of a somnambule.

great præcordial oppression; irregular respiration; continued watchfulness; visual illusions; early and almost unintermitting delirium; a glairy and blood-shot appearance of the eyes; contracted pupils; intolerance of light; gloomy and agitated countenance; continued moaning and coma. (Armstrong.)

When the lungs are inflamed, the ordinary symptoms of pneumonia are superadded to those of typhus. Pain and cramps in the inferior extremities; or, pain along the course of the spine, with irregular and difficult respiration, (unconnected with pneumonic symptoms,) and a peculiar uneasy feeling in the pit of the stomach, indicate the existence of spinal inflammation. The signs of enteric inflammation are often much more obscure. Tenderness and tension of the abdomen; an anxious and disturbed countenance; a very small, quick, and frequent pulse; constant recumbence on the back; much retching or vomiting; longing for cool drink; a burning sensation in the pharynx; difficult deglutition and great prostration of strength, characterize this variety. The patient, however, seldom complains of pain in the abdomen, unless pretty firm pressure is made on its external surface, when his sufferings are, generally, strongly expressed, both by complaints and by the expression of his countenance.

There is another modification of typhus, the *congestive*, which is characterized by the following phenomena: a want of febrile reaction, after the stage of oppression, the system remaining in an oppressed condition, throughout the whole or the greater portion of the course of the disease. The vital powers are overwhelmed and depressed, and the patient appears to sink, progressively, from the moment the disease commences until the vital action ceases altogether. In the more aggravated cases of this kind, there is, from the beginning, extreme lassitude and debility, attended with deep-seated pain in the head, with a feeling of weight and vertigo; the face remains pale; respiration is much oppressed and slow; the pulse is struggling, small, feeble, slow, and variable; the skin relaxed, damp, and usually below the natural temperature; the countenance confused, vacant, and anxious, the patient appearing as if stunned by a blow. The eyes are generally dull, watery, vacant, and often red; the bowels at first torpid; but in the advanced period of the disease often affected with watery diarrhœa. In the commencement, the tongue is pale, slimy, becoming rough and brown afterwards. Towards the close, petechiæ, colliquative hemorrhages, and involuntary stools are apt to occur. Sometimes coma is among the first symptoms, and continues to the end of the disease; and not unfrequently a complete state of insensibility and torpor supervenes soon after the disease makes its attack. (Armstrong.)

Cause.—In relation to the cause of typhus, much difference of opinion exists among physicians. Whilst some maintain that it may be produced by any of the ordinary causes of fever,* others believe that it is essentially a specific disease, and dependent, exclusively, on a peculiar virus or morbific agent. Dr. Armstrong has advanced the opinion, that typhus is often generated by the same miasm that produces remittents and intermittents; an opinion, however, which does not appear to have obtained many advocates. It is, indeed, not to be denied, that when marsh miasmata, or, perhaps, any of the usual causes of fever, act on a system which has been depressed and debilitated by the enervating influence of cold, want of nourishment, mental distress, &c., a low or *typhoid* state of fever will be developed; but the course and characteristic phenomena of such fevers do not accord with those which mark genuine contagious typhus. If koino-miasmata (malaria) were capable of producing typhus, we should find this disease (one might reasonably expect) among the prevailing forms of fever in all miasmatic districts, which, however, is contrary to general observation. During the years 1822–23–24–25 and 26, miasmatic fevers were extremely common throughout nearly every section of this country; and yet, typhus was but very rarely observed. There are, on the other hand, localities where typhus has very fre-

* Good's Study of Medicine, vol. ii. Riel, Fieber-lehre, band. 2.

quently prevailed with great severity, but where intermittents and remittents are almost unknown. Dr. Smith states, that "on the Connecticut river, from Northampton in Massachusetts to its source, a distance of more than two hundred miles north and south, and on all its tributary streams, on both sides, for a hundred miles in width, there has been no instance of any persons having contracted the intermitting fever, from the first settlement of the country to the present time; and yet typhus fever has prevailed more or less in every township within that tract of country." In confirmation of his opinion on this head, Dr. Armstrong affirms that remittents often assume the appearance and character of typhus; and that these two forms of fever resemble each other in many of their most striking symptoms. "Remitting fever," he observes, "is always attended with a simultaneous affection of the brain, the mucous membrane of the respiratory passages, the mucous membrane of the alimentary canal and of the liver—a combination of symptoms always present in typhus." If, however, resemblances of this kind are to be admitted as evidence of identity of cause, we might, with equal propriety, refer small-pox, catarrhal fever—nay, almost every form of disease, to one and the same cause. The characteristics of typhus do not consist in any of these circumstances. With regard to the alleged conversion of remittents into typhus, it may be observed, that the former do, indeed, in some instances, assume a low or typhoid character; but this may be predicated of nearly every other variety of febrile disease, and cannot be justly urged as an argument in favor of the common origin of the two former diseases. I have myself known ten cases of ordinary bilious remittents, brought together in an illy ventilated and narrow apartment, degenerate into low and putrid fevers of a highly fatal character. A system already suffering from a miasmatic disease may, no doubt, be brought under the influence of those morbific effluvia (idio-miasmata), which are generated by a number of persons crowded into narrow, close, and sordid apartments. It can scarcely be doubted, that when these two varieties of miasmata act concomitantly on the system, the product will be a form of fever neither distinctly typhus, nor yet remittent nor bilious in its character.*

Whatever may be the discrepancy of opinion among physicians, in relation to the existence of a typhus contagion, all seem to be agreed upon one point:—namely, that typhus is often generated by that species of miasmata which is evolved in very crowded, confined, and filthy apartments, by the decomposition of human effluvia. The records of medicine abound in examples of the production of typhus by the morbific effluvia generated in crowded and ill-ventilated ships, jails, hospitals, and the confined and sordid hovels of the poor. Although often unequivocally generated in this way, it is scarcely less certain that when once developed, typhus elaborates a peculiar virus or contagion, by which it may be afterwards communicated to those who come within the sphere of its activity. It should be observed, indeed, that there is much weighty authority extant against the existence of a typhus contagion. As positive observations cannot, however, be adequately countervailed by negative facts and speculative objections, we are constrained to give credence to the reality of such a contagion, by the vast body of direct testimony we have of the repeated propagation of this disease in a manner demonstrative of such an agency.† Wedekind states that, during the campaigns of the French against Russia, the typhus contagion, which was generated in the hospitals and houses crowded with prisoners and sick, was communicated to the inhabitants along the road by which the soldiers returned; and afterwards spread gradually from the road-side to the adjacent districts, until the disease became widely prevalent. The rout of the returning army from Poland through Germany, could be distinctly traced, by the desolating train of disease it left behind.

* Dr. Smith on the Etiology of Epidemics, New York, 1827.

† Dr. Marsh's Dublin Hospital Reports, vol. iv. In this memoir there are many cases recorded, which afford powerful evidence of the propagation of typhus by contagion.

Somewhat analogous to the narcotic poisons, the miasm or contagion of typhus possesses a specific tendency to benumb or diminish the sensorial powers, and to depress, generally, all the vital energies. In a state of vigorous health, with the powers of vital resistance unimpaired, the deleterious operation of the typhus contagion is much retarded, and often entirely prevented. In an opposite state of the system, however, when the moral and physical energies are depressed, by that combination of hardships and privations which attend succorless and hopeless poverty, in times of general distress, this morbific agent seldom fails, when once engendered, to manifest its deleterious powers.

The typhus contagion, like that of small-pox, is capable of attaching itself to various substances, more especially to articles of clothing, and thus to retain its power of infecting for a long time. It is asserted, however, that *clean* articles of clothing are never rendered infectious by the deposition of this contagion—(Good)—an assertion which admits, I think, of some doubt. It is, indeed, sufficiently ascertained that filth of every kind greatly favors not only the development, but the activity and preservation of this poison; but we have no satisfactory grounds for denying that it may not attach itself to clothes not dirty, particularly woolens, and retain its powers of infecting for a considerable period.

What length of time the typhus contagion may retain its powers of infecting, when deposited in fomites, cannot, perhaps, be definitely ascertained. Hildebrand thinks it seldom retains its activity more than about three months;* but this, no doubt, depends greatly on various accidental circumstances—such as degrees of confinement, or ventilation, cleanliness, and the nature of the substance to which it becomes attached. Dr. Rush states, that he has known typhus produced by the contagion which was left in a room six months after it had been occupied by patients ill with this disease.

In a pure and free air the typhus miasm extends but a short distance—perhaps not more than three or four feet from its source, in a sufficient degree of concentration to affect a healthy individual. It would appear that pure air is capable of dissolving or decomposing the particles of this contagion, and thus to destroy their power of infecting; or perhaps, as some maintain, the effects of free ventilation in this respect may depend chiefly, if not wholly, on the rapid dilution of the miasm in the air, and its consequent insufficient concentration to affect the system. Be this as it may, it has been well ascertained that there is but very little danger of becoming affected, in the chamber of a typhus patient, provided the air be freely admitted and cleanliness observed. In an impure and confined atmosphere, however, the miasm in question gradually diffuses itself throughout its whole extent, and retains a high degree of activity; and hence, those who visit typhus patients in narrow, dirty, and close apartments are particularly liable to become infected.

Whatever be the virulence or activity of the typhus miasm, experience has ascertained that its power of affecting the human system is greatly under the control of constitutional, as well as of accidental *predisposition* to its deleterious influence. It would appear, even, that the condition of the organization which constitutes this predisposition is peculiar (analogous to that which constitutes the susceptibility to small-pox or measles, &c.), and independent of the incidents of mere grade of constitutional vigor or health. It is asserted by Hildebrand, Hartman, and some other writers, that this susceptibility to typhus is greatly diminished by an attack of the disease; so that the liability to a second attack is, for a considerable time, at least, much lessened, if not entirely removed. Independent of this constitutional or natural predisposition, there are various circumstances of an incidental character which contribute materially to enhance the deleterious influence of this miasm. I have already adverted to the tendency which impure air, want of wholesome nourishment, excessive muscular action, despondency, and personal filth have in favoring the operation of the typhus contagion. It

* Ueber den Ansteckenden Typhus, page 151.

would appear, moreover, that the predisposition to infection from this cause varies with the age of the individual; for the occurrence of this disease in infancy and very advanced age is extremely uncommon. It is remarkable, says Hildebrand, that very young children, who otherwise are so very susceptible of contagious diseases, are extremely seldom affected with typhus;* and it is almost as uncommon to meet with this disease in very aged and withered individuals. No difference, in this respect, obtains in relation to sex; but it would seem that individuals of a delicate and relaxed habit of body are more susceptible of the typhus infection than such as are robust, muscular, and well nourished.

With regard to the proximate cause of typhus, we know but little that is satisfactory. Marcus and Clutterbuck maintain, that inflammation of the brain constitutes the primary and essential pathological condition of this disease. They assert, that traces of cerebral inflammation are almost universally detected on post-mortem inspection—an assertion which is, indeed, very often confirmed in those who die of simple or inflammatory typhus, but rarely in such as have died of the congestive form of the disease. The early, and often severe pain in the head, as well as the heaviness, confusion, and sensorial disturbance manifested in this disease, are adduced also in confirmation of this opinion. That the post-mortem evidence of cerebral inflammation in typhus is, however, far from being so general as is asserted by these writers, is manifest from the testimony of various other intelligent observers. Dr. Kirby, director of the anatomical theatre in Dublin, observes, that the *brain*, supposed by some to be the seat of inflammation in typhus, *rarely* exhibited the characters indicative of such a state. In some this organ was much *paler* than usual: in a very few instances, among a great number of dissections, was there any evidence of sanguineous or serous effusion.† The same observations are made by Dr. M'Cartney, professor of anatomy; and also by Dr. O'Brien.‡

Broussais, on the contrary, regards gastro-enteritis as the proximate or primary pathological state of this malady; and he, on his part, refers with equal confidence to the appearances discovered on dissection for proof of his doctrine.

Hildebrand considers the proximate cause of the disease to consist in a condition of all the mucous membranes approaching to inflammation, which is propagated to the sensorium commune and the nerves.

It may be observed, however, that although inflammation of the mucous membrane of the alimentary canal is a very common affection in this malady, and in cases of a fatal tendency, perhaps very rarely absent, it is still exceedingly improbable that it constitutes the primary and essential pathological condition of the disease, and cannot, therefore, be regarded as its proximate cause. Such inflammations occur, most probably, in the course of the disease, and should be viewed as one among the ordinary morbid consequences of the fever. The importance of attending to this condition of the intestinal canal, in a practical point of view, is by no means lessened by the supposition of its being consecutive; for, whether primary or secondary, its reduction or removal must constitute a very essential part of the remedial treatment.

Prognosis.—To the experienced physician, the general course and degree of violence of the disease, in connection with the degree and situation of the internal local inflammation, will usually afford sufficient data for the formation of a probable prognosis. Observation, however, has made us acquainted with various particular phenomena, as being indicative either of a favorable or fatal termination of the disease, and which it is of importance to bear in mind, in forming a prognosis.

Among the symptoms which appear to indicate a favorable tendency of the disease, are: spontaneous vomiting during the first and second days of the disease,

* Loc. cit., p. 169.

† Transact. of the Associat. of the Fellows and Licentiates of the King and Queen's College, Dublin, vol. ii. ‡ Ibid.

more especially when the unpleasant cephalic sensations are thereby abated; slight hemorrhage from the nose, about the sixth or seventh day of the stage of excitement, is a good indication; and moderate diarrhœa, at an earlier period, is likewise favorable. Pringle asserts, that he has often known the disease subdued by the early occurrence of gentle diarrhœa; when the abdomen remains soft, and free from pain and tenderness to external pressure, it is a favorable sign. Moderate and quenchable thirst during the stage of collapse, is said to be much more favorable than when the patient expresses no desire to drink. A moist tongue during the collapse is a good sign; and so is a moderately free and not very frequent pulse. The most certain sign, however, of a favorable termination, is derived from the state of the sensorial functions. If these are but slightly disturbed during the collapse, the issue will most probably be favorable. Most writers mention deafness as a good sign; Hildebrand, however, has not found this observation confirmed by his experience.

The unfavorable signs are: a change in the expression of the countenance at an early period of the disease; total want of thirst; violent delirium during the stage of excitement; peripneumonic symptoms. But the most ill-boding of all the bad symptoms are: blindness; involuntary flow of tears; difficult deglutition; paralysis of the tongue; continued low muttering delirium; a very frequent, small and irregular pulse; petechia; distortion of the muscles of the face; pain, or great tenderness of the abdomen; meteorism; continued motion of the hands, and picking at flocks; dysenteric stools; insensibility to active vesicatories; aphtha in the mouth; involuntary colliquative stools; colliquative hemorrhages, &c. After all, however, patients do sometimes recover from this disease after many of the most alarming of these symptoms have made their appearance.*

Treatment.—In prescribing for typhus fever, it is of the utmost consequence to bear in mind, that its different stages are characterized by peculiar pathological conditions, each of which demands its corresponding modification of treatment. It is equally important to attend to the general character of the disease, in reference to the three distinct varieties mentioned above—namely, the simple, the inflammatory, and the congestive. A neglect of proper attention to these circumstances has, no doubt, contributed much to the disputes which have existed, and still exist, concerning the mode of treatment best calculated to insure success in the management of the disease. There are physicians who, looking upon the employment of blood-letting in typhus as a practice always extremely hazardous, and very frequently ruinous, regard tonics and stimulants as the only appropriate remedies for its treatment; whilst others, equally vehement in their opposition to the use of tonics and stimulants, go to the opposite extreme, and carry depletion to an extent, which cannot fail, in many instances, to cause irreparable injury. The truth is, that both stimulants and venesection are often indispensable in the treatment of this disease; and both may prove very injurious, when employod without due discrimination, at periods and under modifications of the disease, contra-indicating their use.

During the former stage of the disease, the principal indication is to overcome the torpor of the extreme vessels of the surface, and to recall the circulation from the internal to the external parts. For this purpose, an emetic is, perhaps, the most efficient and beneficial means we possess. Vomiting excited by an emetic seldom fails to improve the condition of the skin, and to obviate the tendency to internal congestions. In many instances, indeed, the early administration of an emetic will interrupt the train of morbid actions and prevent the further development of the disease. Although especially useful in the cold stage of the disease, emetics may be used also with occasional advantage in the early period of the stage of excitement. Hildebrand, indeed, affirms that he has known decided benefit derived from the exhibition of an emetic as late as the fifth and sixth days of the stage of excitement; and the same observation is made by Pringle, Stoll

* Hildebrand, loc. cit.

and Pichler.* Where there is much nausea, with a bitter taste, and an icterode appearance of the eyes, and the arterial reaction is not violent, some benefit no doubt may sometimes accrue from the use of a vomit. As a general rule, however, the employment of emetics in the stage of excitement, more especially where the febrile reaction is considerable, cannot be regarded either as useful or proper. When the disease is complicated with internal local inflammation, they are inadmissible. To this, however, peripneumonic inflammation forms an exception; for in this variety of complicated typhus, an emetic, after a cautious abstraction of blood, will frequently procure much relief. Armstrong seems to prefer antimonial emetics, but this article is apt to irritate the bowels, and to give rise to watery and exhausting alvine discharges. A large dose of ipecacuanha is not so liable to this objection, and experience would seem to show that, in other respects, it is quite equal to the antimony in this disease. To assist the emetic in exciting the action of the cutaneous exhalents in the chilly stage of the disease, the free use of some mild diaphoretic infusion should be enjoined, such as teas made of the eupatorium perfoliatum, balm, elder-blossom, catnip, &c.

Although *active* purging anterior to the stage of excitement can rarely be proper, from its tendency to promote the centripetal direction of excitement and the blood, yet mild laxatives ought to be among the first remedial measures. Calomel in large doses, from ten to fifteen grains, generally answers this purpose well; its usual evacuant effect being two or three copious feculent discharges, with the additional advantage of exciting the regular action of the liver.

Gentle purgatives are, indeed, among our most useful remedies throughout the whole course of the disease. "The full operation of aperients in this disease," says Armstrong, "sometimes reduces the morbid heat of the skin, and the morbid force of the pulse in the stage of excitement, almost as effectually as the affusion of cold water or venesection."

In the commencement of the fever, it will, in general, be proper to exhibit an active purgative, so as to procure free evacuations. Subsequently, however, it will be sufficient to procure two or three moderate stools daily, by means of suitable laxatives or enemata. Calomel followed by a small dose of castor oil, usually answers this purpose very well. Four or five grains of calomel, with a grain of ipecacuanha, may be taken late in the evening, and half an ounce of castor oil on the following morning.

Even in the state of collapse, purgation sometimes becomes essential to the successful issue of the case. In this, as in other low forms of fever, the brain and the whole system are sometimes greatly oppressed by intestinal irritation from acrid and offensive recrementitious matters poured into the alimentary canal, and this is particularly apt to occur in the advanced periods of the disease. In such instances, the prostration is very great, the face flushed, the pulse frequent and irregular, or slow and feeble; the eyes fixed and red, with coma, delirium, or a kind of stunned torpor of the intellectual and sensorial functions. In cases of this kind, a spontaneous discharge from the bowels, of a dark, or black, and highly offensive matter, or the free operation of a purge, will frequently almost immediately improve the whole aspect of the disease. (Armstrong.) I have, in several instances, seen patients almost entirely insensible, and in a state of extreme prostration in the latter stage of typhus, speedily restored to consciousness, and a general improved state of feeling and strength, by the copious discharge of dark offensive matter from the bowels, in consequence of the exhibition of a purge. This oppressed state of the system from intestinal irritation, is especially apt to occur where proper laxatives have been neglected in the commencement of the disease, or where early spontaneous diarrhœa has been incautiously arrested by medicine. When purgatives are deemed proper during the collapse, they should be given in conjunction with stimulants, particularly wine, or the carbonate of ammonia, in a mucilaginous solution. From eight to ten grains of calo-

* Darstellungsversuch der in Mähren, 1805. Ausgebrochenen Epidemi, Bruin, 1807.

mel, followed by the occasional use of a tablespoonful of senna, or of a solution of Epsom salts, assisted with stimulating enemata, usually answers well in such cases. I have given castor oil with spirit of turpentine, with the happiest effect during the collapse.* We may frequently, also, obtain a free evacution of the bowels, by the external application of croton oil to the abdomen. Four or five drops of this oil, with a teaspoonful of sweet oil, should be rubbed in on the epigastrium. I have in several instances procured copious discharges from the bowels, in the course of a few hours, by this application; and I am satisfied that it will seldom fail of producing this effect.

Perhaps the most important remedy in the early period of typhus, with the view of arresting its progress, or moderating its violence, is *mercury*. In the simple variety of the disease, I have known its course effectually interrupted by a gentle mercurial treatment during the forming and early period of the stage of excitement. If the system can be brought under the mercurial influence *during this period*, it will often put a speedy stop to its progress. The plan recommended by Drs. Tully and Minor,† for the exhibition of mercurials in this disease, deserves, I think, the preference. It consists in the administration of small doses of calomel, from one to two grains every three or four hours, until slight manifestations of its specific influence occur in the mouth of the patient. If this quantity acts too powerfully on the bowels, a few grains of Dover's powder should be added, so as to restrain, but not wholly suppress its effects in this respect. Dr. Rush states, that he has known the pulse to become full, and an evident amendment to ensue on the supervention of a gentle salivation. Dr. Warren,‡ of Boston, also testifies to the good effect of mercury in typhus fevers. Among the German physicians, Brandis, A. G. Hecker, Sauter, and Goeden, speak with decided approbation of the employment of calomel in this disease, with a view of its constitutional operation. Hildebrand, on the contrary, declares that he has never known this remedy to do any good, but often harm.

With regard to the employment of venesection in typhus, much difference of opinion exists among physicians. In the simple form of the disease it will seldom be necessary to employ the lancet; but in cases where the arterial reaction is strong in the onset of this stage, the cautious abstraction of blood will often be useful. Of late years the practice of bleeding, even in simple typhus, has been warmly recommended by many practitioners of enlarged experience. Dr. Mills states, that of 9195 typhus patients received into the Dublin Hospital, and who were chiefly treated by blood-letting, 740 died, making the proportion of deaths nearly 1 to 11. He further states, that out of 91 patients in St. George's Dispensary, who were bled, only 1 out of 25 died; and in another place he states, that of 504 typhus patients who were bled, he lost but 1 out of 28.

Against these statements we may quote the experience of Dr. Stocker. This very respectable physician has shown from hospital documents that the success of other practitioners who did not bleed in this disease was greater than that of Dr. Mills, they having lost but 1 out of 12; and Dr. Stocker, in private practice, lost only 1 out of 96. It must be confessed that comparative estimates of this kind are liable to many objections. One thing, however, seems to be conclusively established by these statements, namely, that blood-letting in typhus, under judicious management, is by no means so dangerous a practice as was formerly, and indeed is yet by many supposed. As a general rule, blood-letting must be regarded as unnecessary, and often injurious in the *simple* variety of the disease; but cases even of simple typhus do occur in which this evacuation may be very beneficially practised. The judicious practitioner can seldom fail to perceive when blood-letting is likely to do good. When the pulse is active,

* R.—Ol. ricini ℥i.
Spir. terebinth. ℥ii.—M. ft. To be taken in divided doses in the course of an hour.

† Treatise on Fever.

‡ The Mercurial Treatment of Fever.

quick, and strong, or full and considerably resisting, as is sometimes the case, blood ought unquestionably to be drawn. We must, nevertheless, not forget, in the use of this remedy, that typhus is a disease attended with a radical tendency to prostration: a consideration which will be a sufficient caution to the judicious practitioner to proceed with much circumspection in the use of the lancet, even in cases which most clearly indicate the propriety of the measure.

Another very important remedy in the stage of excitement of typhus is the affusion of *cold water*. When employed whilst the skin is *hot* and *dry*, and the arterial excitement considerable, cold affusions often procure great relief, and sometimes give a speedy tendency to convalescence.* A feeling of chilliness, or a temperature of the skin below the natural standard, or a moist skin, decidedly contra-indicate the use of this remedy. Under opposite circumstances, however, that is, when the skin is dry and elevated in temperature, no remedial measure is more grateful to the feelings of the patient, or more apt to mitigate his sufferings. According to Armstrong, *cold* affusions are rarely beneficial after the fourth day of the stage of excitement; after this period *tepid* affusions of the temperature of about 95°, he says, ought to be used. In general this may be correct, but where the surface is dry, and above the ordinary degree of heat, we may safely and beneficially use affusions at a considerably lower temperature. When the heat of the surface is unequally distributed, *partial* ablutions of the hands or feet will sometimes have a favorable effect. The existence of visceral inflammation forms an objection to the use of this remedy. After the heat of the skin has been reduced by the affusion of cold water, the patient should be dried and laid between two blankets, and warm diaphoretic ptisans administered, such as catnip, balm, or sage tea. When the brain is much affected, we should place the feet in warm water while the cold water is upon the head and over the body. (Armstrong.)

Diaphoretic remedies, such as the spiritus mindereri, the saline effervescing draught, spirit. nit. dulc. with vin. antimonii and laudanum, may be employed as auxiliaries to the more efficient means already indicated in the stage of excitement.† Active sudorifics, however, are rarely admissible. A cup of the elder blossom tea, with twenty or thirty drops of the sweet spirits of nitre, may be given every two or three hours during the stage of arterial reaction. In cases attended with considerable bronchial irritation and cough, Goeden recommends the use of muriate of ammonia in solution, with a large portion of mucilage, and the extract of liquorice to disguise its disagreeable taste.‡

When the stage of collapse has supervened, the plan of treatment must be exciting and roborant. In the employment of stimulants, however, much caution and circumspection must be used lest latent inflammations be roused by overstimulation. In some instances the tendency to visceral inflammation is kept down by the antiphlogistic measures used in the preceding stage; but no sooner are stimulants given on the occurrence of collapse, than violent delirium ensues, the eyes becoming red and filmy, the face flushed, in short, unequivocal symptoms of cerebral inflammation coming on. (Armstrong.) Should the delirium, therefore, become more violent, the skin dry and very hot, and the pulse more frequent and corded, on the exhibition of stimulants, we must either omit their further use, or employ only the milder articles of this kind. When the sen-

* Medical Reports, by Dr. James Currie. Dr. N. Smith, Essay on Typhus.

† ℞.—Spir. mindereri ℥vij—Liquor Ammoniæ Acetati.
Vin. antimon. ℥iss.
Spirit. nitr. dulc. ℥ij.
Tinct. opii gtt. 45.
Syrup limonis ℥ij.—M. Dose, a tablespoonful every two hours.

‡ ℞.—Muriat. ammon. ℥iss.
P. g. Arab. ℥ij.
Extract. glycyrrh. ℥iij.
Spirit. nit. dulc. ℥iss.
Acid. scillæ ℥iii.—M. Dose, a tablespoonful every two hours.

sorial disturbances are moderated, or not increased, and the pulse becomes slower, and somewhat softer and fuller, and the skin less acrid and hot, on the exhibition of stimulants, we may proceed with confidence in their employment. It is best always to begin with the weaker stimulants when the period for their use has arrived. Hildebrand speaks in very favorable terms of the *rad. contrayerva*, and particularly of the *angelica*. When the collapse is not great, these and other analogous articles may often suffice, but in instances of great prostration and sinking we must resort to much more potent excitants. *Wine* is an excellent stimulant in the collapse of fevers. The white wines are the best, and of these Madeira is perhaps the preferable one. The *carbonate of ammonia* also is much employed in this country in the low states of fever. From its diaphoretic tendency it may in general be administered much earlier on the supervention of collapse than wine; for instead of increasing the heat and dryness of the skin, an effect not unfrequently the consequence of the administration of wine, it generally causes a softness of the surface, and a freer and less irritated action of the heart and arteries. It must be given in solution, mixed with a large portion of mucilage. Thus:

℞.—Carbonatis ammon. ʒij.
Pulv. g. Arab. ℥iij.
Sacch. albi ℥ss.
Aq. fontanæ ℥viij.
Tinct. opii gtt. 40.—M. ft. S. A tablespoonful every hour or two.

In extreme cases, wine and the carbonate of ammonia may be given conjointly with advantage. Indeed, when we consider that ammonia has a tendency to counteract the inebriating effects of alcoholic liquors, we have reason to suppose that the union of these two articles is peculiarly appropriate as a stimulant in this disease.* *Camphor* has been long celebrated as a stimulant in cases of low fever with much functional disorder of the brain. The Germans, especially, place great reliance on its use, in instances of this kind. Hildebrand asserts, that in the collapse of typhus, it is one of our most valuable remedies. Its power of moderating sensorial disturbances—particularly delirium, is often more decisively manifested in this disease than that of any other remedy we possess. I have myself had repeated evidence of its virtues in this respect, and am inclined to think that it is not sufficiently estimated by the profession in this country. Camphor may be very conveniently given in the form of solution in sulphuric ether. Thirty or forty drops of a solution of two drachms of camphor to an ounce of ether, may be given every hour or two. Perhaps the best way, however, of administering this article, is in the form of a mixture—thus:

℞.—Pulv. camphoræ ℥ij.
——g. Arab. ʒiij.
Aq. fontanæ ℥viij.
Liq. anod. Hoff. ʒij.—M. ft. S. A tablespoonful every two or three hours.

Musk, also, has been much praised as a stimulant in the collapse of typhus. Where symptoms of nervous excitement are conspicuous, such as subsultus tendinum, tremors, hiccough, delirium, with a copious, pale urine, it will no doubt often do considerable good. In this country, however, we seldom get the genuine article, and as good musk is very expensive, and not upon the whole more efficient than the articles already mentioned, it is not often used by American practitioners.

Opium was formerly a good deal employed in the advanced stage of this disease. Sydenham speaks favorably of its powers, and Cullen thought it valuable for allaying the low delirium in the collapse of the disease. In that oppressed state of the system which is sometimes caused by intestinal irritation in the latter

* [The late Dr. Kuhn is reported to have said, that he had seen more lives saved under desperate circumstances by carb. ammonia and wine whey, than by all other remedies whatsoever,—Mc.]

period of typhus and typhoid diseases—and which is characterized by much jactitation, flushed face, stupor, or partial coma, with a very small fluttering pulse, I have known opium to procure great relief, especially after the operation of a purgative. In general, however, opium is of very doubtful efficacy in this disease—more especially where there is reason to apprehend much cerebral congestion or an approach to inflammation. In all instances, however, where great prostration is attended with much general nervous irritability and sympathetic cerebral disturbance, opium is a valuable remedy; but where the sensorial and nervous energies are *torpid*, as they almost always are in genuine typhus, its effects must be, generally, mischievous. When profuse and exhausting diarrhœa occurs, or dysenteric symptoms, opium with minute portions of calomel will often do much service. In such cases, I have used small doses of Dover's powders; three grains every two hours, with decided benefit.

Phosphorus is a most potent stimulus; but its tendency to excite mucous inflammation renders it a hazardous remedy in a disease which is so prone to gastro-enteritic inflammation. It is but seldom used.

The flowers of the *arnica montana* is a favorite remedy in this disease with the German physicians. Collin (Annus Med. Coutin.), Stoll and Hildebrand, declare that they have used it with marked benefit in the collapse of typhus. It is said to moderate the sensorial torpor and delirium of the disease more certainly and safely than any other remedy we possess. It is given in infusion, in the proportion of one ounce to a pint of water, of which a tablespoonful is exhibited every hour. Goeden asserts that the arnica has a specific tendency to act upon the brain.

Tonics do not possess much power in counteracting the prostration in the collapse of this disease. Their operation is much too slow to afford sufficient support where the vital powers are so rapidly sinking. In this observation we ought, perhaps, to except the *sulphate of quinine;* for it can scarcely be doubted that the liberal use of this potent tonic would frequently contribute promptly, and very efficiently, to the support of the vital energies. Given in doses of from four to six grains every hour or two, it could scarcely fail of elevating and sustaining the actions of the system, where sufficient excitability remained to the impression of such remedies.

Blisters are very variously estimated as remedial agents in typhus. Applied about the period when the stage of collapse is approaching, that is, about the seventh or eighth day of the fever, they sometimes exert a very beneficial influence on the disease. At an earlier period they are apt to increase the general irritation of the system; and at a more advanced stage, vesication tends to increase the exhaustion, and there is much danger from gangrene of the blistered surface. When applied at the proper time, blisters will often improve the state of the skin, and tend to remove irregular determinations of the blood. Applied to the back of the neck, they generally moderate the cerebral disturbance, more especially where meningeal inflammation is present. It is not necessary, nor in general proper, to suffer the vesicatory to remain on the skin until vesication is produced. When the skin is red, which will generally occur in the course of five or six hours, the plaster should be removed, and an emollient poultice applied in its stead. This will rarely fail to raise a blister in a few hours.

During the collapse, or while the patient is delirious, frequent attention should be paid to the state of the bladder. Not unfrequently the urine is retained until the bladder is greatly distended—an occurrence which cannot fail to add to the distress of the patient, and aggravate the general nervous and vascular irritation. When there is reason to suspect the existence of this condition of the bladder, immediate recourse ought to be had to the catheter.*

* [During the malignant typhus which prevailed in the Philadelphia Alms House, in 1817–18, a *post-mortem* examination revealed an over-distended bladder, in every fatal case, until the catheter was resorted to as a palliative remedy. In several cases this resort gave immediate

What has been hitherto said, applies especially to the *simple* form of the disease; and it remains for me to speak of the modifications of treatment proper, when visceral inflammation, or violent internal congestions, attended the malady.

In cases of inflammatory typhus, the antiphlogistic remedies must be promptly and efficiently urged. Blood-letting is here our main stay; but in order that it may prove beneficial it must be employed soon after the supervention of the inflammation. "If it be delayed to the second or third day of the inflammation, it can no longer be employed without risk of irreparable injury." As a general rule, bleeding is seldom proper *after the first twenty-four hours* from the commencement of the inflammation: for the stage of collapse is apt to supervene rapidly on the occurrence of inflammation in this disease. (Armstrong.) It is always best to take away as much blood at once as will make a decided impression on the system. Dr. Armstrong advises that the blood should be suffered to flow until an approach of syncope is induced, and to effect this with as little expenditure of the blood as possible, the patient should be supported in an erect or sitting position, while the blood is flowing. It is not necessary, generally, to take away much blood in typhus to produce an adequate effect. Unless a decisive impression be made on the system, however, little or no benefit will result from this measure. Topical bleeding by leeches or cupping, especially when the inflammation is seated in the abdomen, is also an important means for subduing the phlogistic character of the disease. Too much danger is apprehended, by many physicians, from blood-letting in inflammatory typhus. It cannot, indeed, be pretended that the use of the lancet is without risk in an unskillful hand; but it may be confidently maintained, that in cases attended with visceral inflammation, blood may be abstracted both by venesection and leeches, not only without mischief, but with the greatest advantage, provided it be early practised, and under the guidance of a judicious estimate of the powers of the system, and the exigencies of the case. When the inflammation is seated in the brain, much good is often to be obtained from the application of cold water or ice to the head. In instances complicated with pulmonic inflammation, calomel and opium, *after blood-letting* has been performed, is a remedy of excellent powers. A grain of each may be given every three or four hours. In the typhus pneumonia, which was so prevalent in this country in 1812, I employed this remedy in a number of cases, and frequently with marked advantage. Indeed, when we advert to the fact, that these two articles, in combination, have been highly extolled by many very eminent writers,* in inflammation of the lungs, attended with a high grade of vascular action, we can scarcely doubt of their applicability in pneumonia, when connected with fever of a low grade of excitement. The pain and distress caused by the inflammation, generally soon abate considerably under the influence of this remedy; the skin often becomes moist and cooler, and the pulse more expanded, and less frequent. It must be recollected, however, that where there are symptoms indicative of cerebral inflammation, opium is wholly out of the question. It is particularly in *pneumonic* inflammation that the combination of calomel and opium is valuable; and much benefit may also be sometimes obtained from it in abdominal inflammations.

In leaving this subject, it may be proper to remark, that typhus fever, whether simple or inflammatory, is always attended with a radical tendency to prostration. The pulse may at first be full and active, yet the vital powers are essentially, and *ab initio*, debilitated by the influence of the remote cause of the disease. This declaration does not contradict the recommendation of antiphlogistic means in the stage of excitement. Radical debility and inflammatory action are by no means incompatible: nor need we apprehend danger from a judicious employment of antiphlogistics, where much general vascular irritation is associated

relief to the coma and delirium, and enabled stimuli and nutriment to restore the strength.—Mc.]

* Armstrong, Hamilton, Schmidtman.

with debility of the vital energies. Nevertheless, the practitioner should not forget, that whilst he is employing such measures, there is lurking at the bottom a tendency to ultimate prostration and exhaustion. With this precautionary view of the general character of the disease, he will always proceed with due care in the use of depletory measures, and keep a watchful lookout lest the patient be incautiously precipitated into a fatal state of exhaustion.

In the *congestive* modification of typhus, Dr. Armstrong recommends bloodletting as the most efficient means for relieving the heart and internal organs from the overwhelming load of blood, and re-exciting the oppressed action of the heart and arteries.

As the internal congestions, however, appear to be the *consequence* of a previous loss of energy in the vital powers, and especially of the extreme vessels, it would seem most efficient and prudent to endeavor to remove this condition by means calculated to impart warmth and vigor to the system, and to recall the circulation to the extreme vessels of the surface. The means best calculated to effect these salutary changes, are stimulating frictions and warm applications to the external surface. Bottles filled with hot water, applied to different parts of the body, and frictions with tincture of capsicum, or flannels wrung out of hot brandy, are among the most effectual means for exciting the action of the extreme vessels, and deriving the circulation from the internal organs. Measures of this kind possess the peculiar advantage, in the congestive forms of fever, of exciting the energies of the system instead of diminishing its resources, at the same time that they most efficiently tend to equalize the circulation and remove the congestion. It should be recollected, that typhus is a disease of debility—that the powers of life are weakened from its commencement—and that, consequently, that mode of treatment is best which answers the purpose in view with the least expenditure of the resources of the system. Most assuredly, therefore, the removal of internal congestions by a gradual and invigorating excitement communicated to the nerves and capillaries of the surface of the body, must be much more safe than the attempt to accomplish the same purpose by abstracting blood from the patient, which, though perhaps adequate to remove the congestion, may readily convert apparent into real weakness. That the external and internal exciting measures just mentioned are, in truth, more efficient for removing the congestive states of fever than direct depletion, may be inferred from the observations of Dr. Armstrong himself. "When, after bleeding," he says, "the pulse still remains oppressed, and the tide of circulation does not return to the surface, some wine with warm water should be occasionally exhibited, and the patient speedily immersed in a bath strongly impregnated with salt, and about the temperature of 100° of Fahrenheit. On leaving the bath, the patient should be well rubbed all over with hot flannels, and then laid in an aired bed with bottles of warm water applied to his feet. This plan will often promote the flow of blood to the surface." Now, if even in the most aggravated cases of congestive fever, the internal exhibition of wine, with warm and stimulating applications to the surface, will determine the blood to the extreme vessels, and remove the oppressive internal congestion, we may conclude *à fortiori*, that in the milder instances of the congestive state, this exciting plan of treatment will be still more apt to recall the blood to the surface and equalize the circulation.

In addition to the above means for overcoming oppression from internal congestions, blisters, large doses of calomel, and purgatives are important remedies. The bowels should be freely evacuated as soon as the reaction of the heart and arteries is in some degree re-established. Calomel in large doses appears to be peculiarly adapted to cases of this kind. From ten to twenty grains must be given every three or four hours until the bowels are moved, and its operation promoted by stimulating enemata. Dr. Armstrong observes, that "the power of equalizing the circulation is nowhere more conspicuously displayed than in diseases of a congestive character. Before the exhibition of it the skin will be warm and shrunk, the pulse feeble and oppressed, and the whole system

apparently relaxed; but no sooner is the mouth made sore by its specific influence, than the skin becomes warm, reddish, and distended with the invigorated circulation, while the pulse is full, soft and strong, and the general energy in a great measure restored." My own experience accords fully with these observations. At the same time that calomel is given with the twofold object of procuring its purgative and constitutional influence, active rubefacients or sinapisms may be advantageously applied to the epigastrium. (Armstrong.) The congestive form of typhus often terminates fatally in a few days, and is always rapid in its course. Our remedies must, therefore, be promptly and diligently applied in cases of this kind. After the reaction has been established, the same general plan of treatment applicable to simple typhus must be pursued.

With regard to the dietetic management of this disease, it is scarcely necessary to state that the simplest kinds of liquid nourishment are alone admissible. Of these, however, the patient may be allowed as much as he can be induced to take, more especially during the sinking stage of the complaint. By keeping the stomach and bowels moderately distended with bland liquids, considerable support is given to the sinking powers of the system, and good, moreover, probably arises from it by its tendency to allay intestinal irritation, and affording the absorbents a supply of mild and invigorating fluid for the support of the system. Dr. Stoker states, that in the late epidemic typhus of Ireland, many of the patients who were brought into the Dublin Hospital, began to recover almost immediately on being allowed the free enjoyment of mild nutritious fluids. Dr. Samuel Colhoun, of this city, adopted a similar plan of treatment in the Pennsylvania Hospital, some years ago, and the result was entirely favorable.*

During convalescence, tonics in moderate doses, such as the infusions of cinchona, serpentaria, chamomile, slightly acidulated with sulphuric or nitric acid, may in general be employed with advantage. The diet during this period should be mild, digestible, and nourishing, and particular care must be taken not to oppress the stomach by taking more food at a time than can be easily digested. Weak wine and water may be taken occasionally.†

* See his Essay on this subject, in the fourth volume of the Medical Recorder.

† [Of late very respectable attempts have been made to separate the cases of continued fevers which occur in Europe and this country into two distinct species or forms;—one of which is called typhus, and the other typhoid or *ileo-typhus*. Among those who have written most elaborately and classically upon this subject is Professor Bartlett, now of the Maryland University. Dr Gerhard, of this city, has also published many excellent observations in elucidation of this subject and in confirmation of the views of Louis. The typhus prevails in London, the typhoid in Paris. The latter is, according to Dr. Gerhard, the most common form of continued fever in this country. In typhus there is more congestion in the brain and substance of the lungs—hence it has been denominated by some *broncho-typhus*. In this form there is more stupor, which begins earlier and is present in every case. Delirium and subsultus are almost invariably present. The skin, if there be any power of reaction, is always hot and burning. The pulse, rapid and variable; often undulating. The tongue dry and black, the fetor intolerable. In typhoid fever there are less stupor, delirium and subsultus—indeed, these symptoms are often absent. The tongue is less darkly furred than in typhus—this consisting generally of a white fur until the later stage. The pulse is less frequent and more steady. The skin less hot—often moist and perspiring throughout the whole progress of the disease. The eruptions in typhoid fever are confined mainly to the abdomen, and do not extend over the whole surface as in typhus. In fact, typhus has been regarded as a really exanthematous disease in consequence of a universal eruption of petechiæ, which generally appears about the fourth day, and but partially disappears on pressure.

The average duration of typhus is less, and death often takes place earlier than in typhoid fever. The most striking of the *post-mortem* appearances in typhus is that of congestion or engorgement in the lungs, and also in the brain. The blood is dark-colored, and often fluid or dissolved. But there is no real anatomical character in typhus, such as prevails, according to Louis, in all cases of typhoid fever. There are well marked lesions of the alimentary canal and of the spleen. The spleen enlarges and softens remarkably, but gradually recovers its natural condition in case the patient gets well. The true anatomical character of this disease, however, is an inflammation, enlargement, and finally ulceration of the conglomerate glands of Peyer, above the termination of the small intestines, near the ileo-colic valve. The follicles of Bruner are sometimes also affected, and the same appearance extends down some distance into the

II.—GENERAL IRRITATIVE DISEASES OF THE BLOOD-VESSELS, CONNECTED WITH, OR DEPENDENT ON, LOCAL INFLAMMATION.

CHAPTER IX.

OF INFLAMMATION IN GENERAL.

Preliminary to considering the general affections which properly belong to this head, it will be necessary to treat of the phenomena, nature, and progress of *inflammation*. The scope of this work does not admit of a full discussion of this interesting subject, but it is believed that the following summary will be found to embrace all that is really important or well established in relation to this form of vascular disease.

Although *inflammation* is characterized by *pain*, *increased heat*, *redness* and *swelling*, yet none of these phenomena are to be regarded as strictly essential to its existence. Each of these phenomena, too, is greatly diversified in its character, according to the nature of the structure in which the inflammation is located. Thus *pain*, though generally present, is not always so, and it would seem that the looser the structure, the less violent in general will be the sensation of pain. Inflammation of the lungs, of the mucous membrane of the stomach and bowels, of the brain,* and of the pericardium, has been found from the commencement, to its termination in death, entirely unattended with pain. Even the character of the pain is modified by the nature of the inflamed structure. In the mucous membranes it is burning or stinging; in the pleura it is lancinating and generally extremely acute; in the ligaments, or fibrous structures, it is dull, aching, and gnawing; and in the nerves rapid, darting, and excruciatingly severe. But although the pain may sometimes be very trifling or even absent in inflammation, a feeling of soreness or aggravation on pressure always occurs. In this, inflammatory pain differs essentially from the pain which attends spasm.

The violence of the sympathetic febrile reaction is in general proportionate to the intensity of the pain experienced in an inflamed part. Thus, in acute bronchitis, or peripneumonia notha, there is neither very severe pain nor very vigorous reaction of the heart and arteries; whereas, in inflammation of the pleura, both the pain and the febrile reaction are almost always extremely great.

Increased heat is another general phenomenon of inflammation which is sometimes absent. The sensation of heat in an inflamed part does not appear to depend on any actual accumulation or elevation of temperature measurable by the thermometer, but on the altered state of the sensibility of the nerves implicated in the inflammation; for the sensible heat of an inflamed part rarely indicates more than 90° of Fahrenheit's thermometer.†

colon. The mesenteric ganglia are also often inflamed and softened in connection with the intestinal follicles with which they are associated by the lacteals. If the patient recovers, the ulcers gradually cicatrize, and the enlargement of the mesenteric glands disappears. In the meanwhile, however, the patient is subject to a diarrhœa and tympanitic distension, and occasionally to bloody evacuations.

The English physicians do not, as yet, appear to have given in their adhesion to the doctrine of Louis, but generally regard these organic lesions as accidental complications—not essential to the character of any disease. In this country, however, a large portion of the profession consider them as peculiar and essential—bearing the same relation to typhoid fever as the pustules of small pox maintain with the febrile symptoms of that contagion.—Mc.]

* Med. Chir. Rev., Jan. 1827, p. 234. † Hunter on the Blood.

The most invariable phenomenon of inflammation is *redness*. It arises from the passage of red blood into the serous capillaries, which either from debility, and consequent relaxation, or from an altered state of their specific sensibility, offer no resistance to the intromission of the red globules of the blood. This redness generally remains after death, and affords one of the ordinary post-mortem evidences of inflammation. Redness, by itself, however, cannot be regarded as a certain sign of previous inflammation, for the serous capillaries may become injected with red blood in *articulo mortis*, although wholly free from previous disorder. I have already adverted to this fact, and to the erroneous inferences it may lead to, in the preliminary chapter on the pathology of fever.

Swelling is always more or less present in the soft structures, and appears to depend on effusion of serum into the surrounding cellular tissue, and on the dilatation of the capillary vessels. The firmer the structure is, the less swelling will occur from inflammation.

Inflammation is an affection of the capillary system of vessels, and appears to consist of an altered condition of their vital properties, with inordinate sanguineous congestion, and hence the more abundant the capillaries of a part are, the more apt it is to become inflamed. The mucous, serous, cellular and dermoid structures being peculiarly vascular, are much more frequently affected with inflammation than the osseous, cartilaginous and tendinous structures. (Bichat.)

Inflammation may be produced, 1. By the *direct* operation of irritating causes on the animal structure; as wounds, bruises, burns, mustard, cantharides, turpentine, the acids, or various caustic substances. 2. By the *indirect* operation of irritants, through the medium of the nervous system. Thus, acid in the stomach will sometimes give rise to superficial cuticular inflammation; and meningeal inflammation is frequently the consequence of irritants acting on the mucous membrane of the intestinal canal. 3. By general increased action of the heart and arteries, as frequently occurs in synochal fever, where any portion of the capillary system is accidentally debilitated, and thereby predisposed to inflammation. It is in this way that most of the inflammations which occur in fevers arise, for when the momentum of the general circulation is augmented by the increased action of the heart and arteries, the blood will, by its impetus, be forced into those capillaries which, from debility, either accidental or induced by the remote febrific cause, offer less resistance to its intromission than they do in a state of natural vigor. 4. By the metastasis: thus, erysipelas sometimes passes in and fixes upon an internal organ; and gout occasionally passes from the feet to the stomach, brain, and to various other parts.

Whatever may be the remote existing cause of inflammation, it is probable that the following changes are effected in the progress of its evolution. 1. *Irritation*, that is, a certain inordinate or hurtful impression on the nervous filaments of the part, by which a new and irregular excitement is produced in them, called irritation. 2. *Alteration of the vital properties* of the capillaries of the part thus irritated or disturbed by the unnatural impression; and 3. An afflux, or determination of the blood to these capillaries. (Bichat.) These changes often succeed each other so rapidly, that they seem to occur simultaneously. A change in the sensibility and irritability of the capillaries, would seem to be essential to the existence of inflammation; for where these vital properties remain in their normal state, preternatural determination of the blood into them does not constitute inflammation, but only *congestion*, or local plethora.*

Are the capillaries of an inflamed part in a state of *debility* and *passive relaxation*, and is the velocity of the blood circulating in them diminished, as is contended by Vacca, Lubbeck, Allan, Philip, and Hastings; or, are these vessels in a state of *increased action*, and the momentum of the blood within them augmented, as is maintained by Hunter? Upon these points there has been a great deal written both *pro* and *con*, and the subject is still not well settled. My own

* Bichat. General Anatomy.

view on this subject is, that the inflamed capillaries ought to be regarded as being in a state of irritation, and that this irritation may be connected either with an *increased* or *decreased* power of action. In this respect, local inflammation corresponds with that general irritated vascular excitement which constitutes fever. The heart and arteries are in a state of irritation *with increased power of acting* in synocha. In typhus, there is also general vascular irritation; but it is connected with *a fundamental debility of the vital powers*. There is, therefore, according to my apprehension, a typhus and a synochal state of local inflammation; and this corresponds with the results we obtain from remedial applications. May we not explain these different *diatheses* of inflammation by the greater or less degree of *organic injury* sustained by the nervous filaments of the inflamed capillaries? When a part is irritated, so as to *exalt* the sensibility of the capillaries, by exciting their nervous texture, the consequent inflammation will probably be one of *increased* capillary action, and demand sedatives for its cure; when, on the contrary, the irritating cause acts with such violence as to cause structural lesion in the nervous extremities, or when from the long continuance of the inflammation, the capillaries have in some degree lost their energies, the inflammation resulting from its action will be characterized by debility, and demand stimulating applications, as is the case in scalds and burns.

Terminations of inflammation.—Inflammation is said to terminate in *resolution*, when it declines and disappears without having induced any structural lesion, or perceptible discharge. It consists in a gradual return of the vital properties of the inflamed part to their natural condition, and a consequent resumption by the capillaries of their ordinary or healthy action, before either some portion of the affected parts is destroyed from total loss of vitality, or *new* secretions are formed by the morbid action of these vessels. Termination by resolution is always more prompt in proportion as the inflamed part is endowed with a higher degree of vitality. (Bichat.) Frequently the termination of inflammation by resolution is accompanied by an increase of the natural secretions of the affected organ; and this is particularly noticed in the mucous membranes, as in catarrh and coryza, where an increased secretion of mucus always announces the favorable termination of the inflammation. The same fact is also conspicuously exemplified in rheumatic inflammation, which rarely terminates without an increased exhalation of serum into the surrounding cellular structure. *Effusion* is another of the terminations of inflammation. The fluid effused may be either blood, or lymph, or serum. The termination by effusion of *blood* occurs most commonly from the softer and more vascular structures, more especially from the surface of *mucous membranes*. Lymph and serum are rarely effused from this structure, these effusions being almost peculiar to the *serous* membranes. The *lymph* which is thus effused in the declension of inflammation from serous membranes, often forms a bond of union, and causes firm adhesion between them when contiguous to each other. It is thus that the costal and pulmonic portions of the pleura are so frequently found united, in consequence of thoracic inflammation. In the *mucous* membranes, such adhesions never occur from inflammation; and this is one of those wonderful adaptations in the animal economy, in which the benevolent design of an all-wise Providence is especially conspicuous; for without this peculiarity in the mucous structures, we should be continually liable to the adhesions between the surfaces of the various excretory ducts, as well as of those of the alimentary canal and respiratory passages, since these are more frequently affected with inflammation than any other parts of the animal system. When lymph is effused into the substance of the solid viscera, or into the cavities of the cellular tissue, it causes a consolidation of these parts, forming what are technically called indurations. The spleen, liver, and lymphatic glands, are particularly liable to these consequences from inflammation.

Suppuration, also, is one of the modes in which inflammation is wont to terminate. Of all the animal tissues, the *mucous* and *cellular* are most liable to this mode of termination. The bones and tendons never enter into the suppura-

tive action from inflammation; and the *serous* membranes, though liable to suppuration from inflammation, are much more apt to pour out an increased flow of serous fluid. The product of the suppurative process differs conspicuously in the different structures that are liable to it. In the mucous membranes, the fluid elaborated by this morbid action consists of a whitish, cream-like, or greenish appearance, denominated pus. In the *serous* membrane, the pus is formed by a kind of exhalation, and consists of a thin, *whey-like* fluid, generally intermixed with flakes of coagulated lymph. Suppuration of the cellular tissue produces a thick pus, of a pale-yellow colour and uniform consistence, exhibiting, under the microscope, the appearance of minute globules suspended in a serous fluid. The grade of inflammation which results in suppuration, transcends that which is necessary for the secretion of lymph; and hence, round the circumference of inflamed parts, involving cellular tissue, where the inflammation is less active than at the central portions, lymph, and not pus, is formed: in consequence of which, the cells adhere to each other around the internal suppurating space, and form a circumscribed cyst or cavity in which the pus is retained, constituting an *abscess*. The occurrence of suppuration in an internal organ, is generally manifested by a sensation of weight in the region of the affected part; a change from an acute to a heavy, dull, and throbbing pain; rigors; a change from a hard, tense, and quick pulse, to a soft and moderately full one; night sweats, and other symptoms of hectic.

Inflammation may also terminate in *gangrene*. This mode of termination never occurs in the cartilages, nerves, and bones; the mucous, cellular, and serous tissues being most prone to it. Of the serous tissues, the *peritoneum* appears to be most apt to become gangrenous from inflammation; and of the mucous membranes, that which lines the alimentary canal is most subject to this termination. The occurrence of gangrene is attended with a sudden cessation of pain; sinking of the pulse; cold extremities; cold sweat; indistinctness of vision; slight delirium; and a cadaverous expression of the countenance.

The four modes in which inflammation terminates, appear to be determined by four corresponding grades of the inflammation. This is strikingly illustrated in the phenomena of common phlegmon or boil. Along the circumference, where the inflammation is weakest, there is serum effused into the surrounding cellular structure; a little further towards the centre, where the inflammation is somewhat greater, lymph is thrown out, and adhesions formed; within this circle, where the inflammation is still more violent, pus is secreted; and at the central portions gangrene and sloughing occur. (Hunter.)

The different forms of inflammation manifest different tendencies in relation to these terminations. In boil and whitlow, there is an especial tendency to suppuration; in carbuncle, the disposition is to terminate in gangrene; and in rheumatism and mumps the tendency is strongly to resolution. Indeed, so strong are "these original dispositions to terminate in one mode rather than another, that it is very difficult to procure any other termination than the one to which the tendency exists."*

Inflammation occurs under five prominent modifications, corresponding to the five elementary tissues, viz.: the cellular, the serous, the mucous, the dermoid and the fibrous.

1. Inflammation of the cellular tissue or phlegmonous inflammation is characterized by great swelling, throbbing pain, and by its peculiar mode of suppurating—the pus being collected in circumscribed cavities.

2. Inflammation of the serous structures, or serous inflammation, distinguished by very acute *lancinating*† pain; little or no tumefaction; much sympathetic reaction of the sanguiferous system; by its tendency to terminate in the exuda-

* Observations on the Nature and Treatment of Inflammation. By J. H. James, p. 17.

† [This is true of the pleura. In the peritoneum, however, there is generally an exquisite tenderness.—Mc.]

tion of coagulable lymph or serum, or the secretion of a thin, whey-like pus. It is peculiarly rapid in its course, and is not apt to terminate in gangrene. Adhesions are peculiar to this and the former modification of inflammation.

3. Inflammation of the mucous tissues or mucous inflammation, is attended with a burning or stinging pain, without tumefaction of the subjacent cellular structure; the sympathetic fever attending it is not vehement; and it never terminates in resolution, without an increase of the mucous secretion.

4. Inflammation of the dermoid system, or erysipelatous inflammation, is attended with a burning pain; it spreads irregularly over the surface of the skin, forming vesicles or blisters, containing a transparent straw-colored serum, and never forms adhesions, or suppurates in circumscribed cavities. This variety of inflammation generally depends on constitutional causes, and it would seem, in some instances, a specific cause.

5. Inflammation of the fibrous structure, or rheumatic inflammation, is accompanied with intense aching or gnawing pain; and is particularly indisposed to terminate in suppuration or gangrene—its almost universal termination being in the exudation of serum and a gelatinous fluid, or in the deposition of earthy matter. It is apt to change its situation from one place to another, and sometimes passes suddenly to the internal organs. The sympathetic fever which accompanies its acute form is always very vigorous. This modification of inflammation rarely proves fatal, unless by metastasis to organs essential to life.

The existence of internal inflammation is ascertained by the pain continuing without much remission; the appearances of the blood, which, when drawn, very generally exhibits a sizy or buffy crust on the crassamentum; by the presence of fever, which does not attend spasmodic or nervous pain, by the effects of *external pressure*, more especially in abdominal inflammation—thus causing an aggravation of the pain, or a feeling of great soreness—whilst in spasmodic pain, a mitigation of the patient's sufferings is usually the consequence of pressure. The effects of position also throw light on the diagnosis of internal inflammation; thus, in abdominal inflammation, the patient lies on his back, with the knees drawn up, and the head and shoulders raised, in order to obviate pressure from the tension of the abdominal muscles. The character of the functional derangement, moreover, will assist us in ascertaining the existence of internal visceral inflammation; and, finally, the nature of the exciting causes will aid us in the diagnosis.

Inflammation occurs under two principal varieties, in relation to the rapidity of its progress and the violence of its phenomena—namely, *acute* and *chronic* inflammation. The former is rapid in its course, and violent both in its local and symptomatic phenomena. The latter is generally, though not always, the consequence of the former, and is characterized by a slow progress, and much less intensity in all its symptoms. In the serous membranes, chronic inflammation results either in the effusion of serum, giving rise to dropsical accumulations, or to a gradual change of structure, such as thickening and induration, and frequently to the formation of miliary tuberculous matter. In the mucous tissues, the usual consequences of this variety of inflammation are phthisis, diarrhœa, dyspepsia, and various other local and general affections; and in the solid viscera and glandular structures, induration, scirrhus, and other organic changes are its effects.

To the pathologist and medical practitioner, the sympathetic phenomena of inflammation constitute one of the most interesting and important objects of attention. Among the multifarious febrile affections that are met with in practice, whether acute or chronic, there are comparatively but very few in which local inflammation does not exist in some organ or structure; and, although in the majority of instances, these inflammations are secondary, or developed after the commencement of the fever, their influence in protracting the disease, and aggravating its phenomena, is, perhaps, not the less conspicuous. Whenever febrile irritation becomes much protracted or chronic in its course, we may infer, with little chance of mistake, that there exists some obscure focus of inflammation in

an internal part. Pure idiopathic or general fever, without the accessory irritation of local inflammation, can never continue very long. Mere morbid excitement, from general causes or movable irritants, is generally soon overcome by the organic, or what has been called the sanative actions of the animal economy.

CHAPTER X.

OF THE PHLEGMASIÆ OF THE ALIMENTARY CANAL, AND ITS ACCESSORY ORGANS.

Sect. I.—*Of Glossitis.*

Acute inflammation of the tongue is not a frequent disease; but when violent, it is a very severe, and often rapidly fatal affection. It usually begins with a burning and throbbing pain in the tongue, attended with febrile symptoms, which soon rise to a high synochal grade. The tongue soon becomes hot, dry, red and swollen, the swelling generally increasing rapidly, so that in a few hours it fills almost the whole cavity of the mouth, and is often thrust out between the teeth, appearing like a mass of raw flesh. The respiration becomes extremely difficult, and a horrible sense of impending suffocation is experienced. The patient can neither move the tongue nor swallow. In some instances suppuration takes place; and one or more small abscesses are formed in the substance of the tongue, which are seen pointing on some part of its surface at the same time that the pain and swelling subside. Instances have occurred in which mortification of the tongue has taken place, or partial sloughing of its substance; and the inflammation has been known to terminate in induration of its structure.* The tongue occasionally swells so rapidly and greatly, as to occasion death by suffocation in a very short time. I have known a case terminate fatally in less than twelve hours from the commencement of the disease.

More or less inflammation of the tongue generally accompanies laryngitis; and it occurs also occasionally in cynanche tonsillaris; but in instances of this kind, the inflammation and tumefaction of this organ scarcely ever become very considerable. Glossitis may arise from the operation of local irritating causes on the tongue; such as acrid substances taken into the mouth; wounds; bruises; the sting of an insect; scalding; calculous concretions in the salivary ducts. It may also be produced by atmospheric vicissitudes, or the influence of cold and damp atmosphere. Dr. Hosack relates a case which was caused by sitting in a current of cold air immediately after being much heated by exercise. Reil states that glossitis has occurred epidemically;† and Stark has known it to come on periodically, in consequence of suppressed menstruation.‡

Treatment.—General blood-letting, promptly and decisively practised, followed by the application of leeches along the margin of the lower jaw, and, if practicable, to the lower surface and extremity of the tongue, are indispensable remedial measures in this affection. Much advantage may also be derived from scarifying the anterior part of the tongue; and still more from making an incision into its substance along the middle. This practice was particularly recommended by De la Motte§ many years ago; and in a late number of the Edinburgh Medical and Surgical Journal, an interesting case is related by Mr. Martin, which was

* Richter's Specielle Therapie, Band. i. p. 497.
† Fieberlehre, tom. ii. p. 411.
‡ Handbuch zur Kennt. und Heil. der innern Krankh., p. 140.
§ Med. de l'Acad. de Chirurg., tom. v.

successfully treated by incisions.* Reil also (*loc. cit.*) speaks strongly in favor of *superficial* incisions, from an inch and a half to two inches in length, along the middle of the tongue. The bleeding must be promoted by emollient gargles. Richter says that the swelling generally subsides speedily after the incisions; and they readily heal without any disagreeable consequences. From the impossibility of swallowing, internal remedies cannot be employed. Laxative enemata, however, are very useful, and should be frequently administered until the bowels are well evacuated. Considerable benefit may also arise from a large blister laid on the back of the neck or on the throat, after proper general and local depletion has been employed.

Sect. II.—*Of Tonsillitis.—Cynanche Tonsillaris.—Quinsy.*

In this variety of angina, the inflammation is seated in the tonsils, soft palate, and fauces, and is of a strictly phlegmonous character. In cold and variable climates it is a disease of frequent occurrence, and although by no means so dangerous a malady as the anginose affections of the respiratory passages, it is much more painful, and in violent cases always alarming, and sometimes fatal.

Symptoms.—The disease usually begins with slight chills, succeeded by a high grade of febrile reaction, accompanied with an uneasy feeling in the fauces, and more or less pain in this part on swallowing. In a few hours a fixed pain is felt about the region of the tonsils, and the act of deglutition becomes more and more painful, until at last it is attended with extreme suffering, or altogether impossible. On examining the throat one or both tonsils are found very much swollen, and the whole surface of the fauces very red and somewhat tumefied. The tongue also is swollen, white, and covered with a thick layer of transparent viscid mucus. The face is red and tumid; the carotids beat strongly: respiration is difficult; hearing obtuse; the pulse frequent, hard, and full; and the voice is indistinct or whispering. In general, much more difficulty and pain are experienced in swallowing liquids than soft or pultaceous solids. The pain generally shoots from the fauces into the ears, particularly on attempting to speak or to swallow, and the mouth is opened with great difficulty and pain. A very thick ropy mucus commonly adheres to the inflamed parts, and contributes much to the difficulty of respiration. The uvula and soft palate are generally very much swollen; but the principal pain and difficulty of breathing arise from the tumefied tonsils; for when both are inflamed, they sometimes become so much enlarged as to come in contact with each other, confining the tumid uvula behind them, or pressing it forwards into the mouth.† The external part of the throat, in the region of the tonsils, is always somewhat tumefied and tender to the touch. In some instances the tonsils are covered with flakes of coagulable lymph, of a whitish color, resembling superficial sloughs. Occasionally small excoriations or ulcerations occur on the inflamed tonsils. These ulcers arise from small yellowish pustules bursting and pouring out a lymph-like fluid, which concretes into a whitish pseudo-membranous layer on the surface of the tonsil. This, after

* The tongue, in this case, "increased in size until it protruded from the mouth, and separated the jaws. The organ was smooth, hard, and covered with a thick coating of viscid saliva. The patient was bled to 30 ounces, with some relief—and the same quantity of blood was taken in an hour after, which enabled him to articulate distinctly. In three hours more, the swelling had increased—respiration through the mouth was impracticable, and that through the nostrils was difficult—in short, suffocation was threatened. A deep incision was made in the most prominent part of the right side of the tongue, from whence issued a quantity of blood and pus, with evident relief. Two other incisions were made when the first ceased to discharge blood. In a quarter of an hour after the first incision, the patient could articulate distinctly—respiration was free. Next day he was nearly well."—*Med.-Chir. Rev.*, October 1827.

† We may be skeptical, however, with regard to the assertion of Marcellus Donatus, who affirms that he has seen the uvula thus pressed forwards by the swollen tonsils, *ad anteriores usque dentes.*—*De Medica Historia Mirabili*, p. 84.

some time, separates, and exposes a bright red and very sensible surface or erosion, from which a purulent matter is discharged.*

The inflammation in this affection terminates either in resolution or suppuration, gangrene being an extremely rare occurrence. In no structure is inflammation more apt to terminate in abscess than in the tonsils. Internal suppuration often occurs in a few days, notwithstanding the most active local and general antiphlogistic measures. The quantity of matter discharged from a suppurated tonsil is seldom so abundant as to become very perceptible in the sputa, a portion of it, no doubt, being commonly swallowed with the saliva. Cases occur, in which the abscess, instead of breaking internally, is gradually enlarged, and extending outwards, points externally under the angle of the jaw. Dodonæus relates a case, in which the patient appeared near dying, where speedy relief was obtained by an external incision into the abscess, and the consequent discharge of a large quantity of pus.† Frequent attacks of the disease are apt to produce permanent enlargement and induration of the tonsils. In some instances the inflammation passes down into the larnyx, an occurrence which always greatly increases the dangerousness of the affection.

Causes.—Some individuals are peculiarly predisposed to this variety of angina. This is especially observed in persons who have already once or twice suffered an attack of the disease. The constitutional influence of mercury, or salivation, appears to create an increased aptitude to this affection; a strumous habit, also, appears to constitute a state of predisposition to the disease.

The ordinary exciting cause of this complaint is cold and damp air, or cold applied in any manner so as to give a sudden check to the perspiration. Standing long on cold and wet ground is particularly apt to give rise to the disease in those who are predisposed to it. It may also arise from local causes, such as irritation from the cutting of one of the posterior teeth; (Sachse, loc. cit., p. 475;) the fumes of arsenic; (Sheffler, von. d. Gesundh. der Bergleute;) acrid substances, swallowed or applied to the fauces. (Fabricius, cent. iv. obs. 15.)

Treatment.—The treatment must be vigorously antiphlogistic; and although Cullen asserts that a copious abstraction of blood is seldom necessary, general experience is decidedly in favor of prompt and efficient bleeding in this affection. In slight cases we may sometimes subdue the inflammation without blood-letting, but as we cannot be sure, at first, whether the disease will continue a mild course, or acquire much severity, it is always best at once to moderate the momentum of the circulation by depletion. Local bleeding, by scarifying the tonsils, generally produces excellent effects, and may be accounted much more efficacious than the application of leeches to the throat or under the ears.‡ Cupping on the back of the neck and under the ears, may also be resorted to with benefit. Baglivi asserts that he has known the abstraction of blood, by cupping between the shoulders, afford great advantage in this affection. Internally, purgatives and the usual antiphlogistic diaphoretic remedies must be actively employed. An active purge should be one of the first remedial measures adopted; the bowels must afterwards be kept freely moved, either by the daily repetition of purgatives, or frequent laxative enemata. A bolus of calomel and jalap, or from fifteen to twenty grains of the compound extract of colocynth, with ten grains of calomel, or a full dose of one of the neutral purgative salts, may be used for this purpose.

Nitre with antimony, in the usual proportion of the nitrous powders, constitutes the best refrigerant diaphoretic in this complaint. Some advantage may be gained by placing the nitre on the tongue, and swallowing it as it is gradually dissolved in the mouth. The muriate of ammonia, dissolved in water with the

* Dr. W. Sachse, Encyclopädisches Wörderbuch der Medicinischen Wissenschaften. Band. ii. p. 464.

† Obs. Med., p. 192, as quoted by Van Swieten.

‡ Kopp, an eminent German physician, says, that blood drawn from the tonsils by scarification, is the best, most certain, and promptest remedy we possess in this affection.

extract of liquorice, has also been particularly recommended.* Much benefit may, in general, be derived from nauseating doses of tart. emetic. I have frequently prescribed this remedy with the happiest effect. A grain of tart. antim. may be dissolved in two ounces of water, of which a teaspoonful is to be taken every half hour, so as to keep up a considerable degree of nausea for several hours.

Emetics were formerly a good deal employed in this variety of angina, but their effects are much less beneficial in this than in any of the other anginose affections.

As soon as the momentum of the circulation has been moderated by venesection, a blister should be applied to the throat, or on the back of the neck. In slight cases of the disease, rubefacients, particularly the spirits of turpentine, or a liniment composed of two parts of ac. ammoniæ to one of sweet oil, will in general suffice for this purpose.

Emollient poultices, also, are very useful applications in simple cases of the disease. When employed as soon as the disease commences, together with a warm pediluvium, and a purgative, the further progress of the inflammation will sometimes be speedily and effectually checked. In such instances three or four folds of thick flannel round the neck, with the auxiliaries just mentioned, are sufficient frequently to prevent the development of the malady. In all instances, however, where the inflammation is considerable, vesication is decidedly the most proper.

Various gargles and other applications to the seat of inflammation have been recommended in this affection. Cullen advises a decoction of oak bark, with alum dissolved in it, as a gargle in this disease. I have generally preferred using simply warm water, slightly acidulated with vinegar, for this purpose. Little or no advantage results from the use of gargles in this complaint, beyond that of dissolving and removing the viscid mucus which is apt to adhere to the tonsils and palate, and this is best effected by warm water, either alone, or with a portion of some vegetable acid, and perhaps honey. Pringle states that he never derived any benefit from astringent gargles; and Storch asserts that he has known them to do very evident harm, by checking the exhalation and secretion from the mucous surface of the inflamed parts. The inhalation of different vapors is one of the oldest remedies in this disease. Hippocrates used the vapor of vinegar and water for this purpose.

M. Toriac asserts that the application of lunar caustic to the tonsils in the early stage of this complaint, almost always speedily arrests the inflammation and swelling. He has related several cases, which were completely subdued by this application, in less than two hours. In the case of a lady, whose tonsils were inflamed and so much enlarged as to threaten suffocation, every disagreeable sensation was removed in one hour by the application of the *nitrat. argent.*†

When the inflammation has terminated in the formation of a tonsillar abscess, it should be pierced with a lancet, to give exit to the matter, an operation which always gives immediate relief from the pain and difficulty of respiration. After the pus is discharged, the patient should continue the use of some mild and slightly acidulated or astringent gargle.

Sect. III.—*Of Parotitis.*

Mumps.

Parotitis is a specific inflammatory affection capable of being propagated by a peculiar contagion, and occurring sometimes epidemically.

The disease usually commences with slight febrile symptoms, with a feeling

* Loeffler. Beiträgen zur Arzn. Wissensch. 1 Th. Leips., 1791, p. 142.

† The Amer. Jour. of the Med. Sciences, vol. v. p. 212, quoted from *La Clinique*, &c.

of stiffness of the jaws, and a little swelling and pain either in one or both parotid glands. The swelling gradually increases until about the fourth day from the beginning of the disease, at which time the affected gland is greatly swollen and very firm and tender to the touch. The skin on the tumor is generally of a natural color, or but slightly inflamed; although, in some instances, a pale redness is diffused over the swelling. Mastication and deglutition are always attended with considerable pain. The fever is generally mild, and is often attended with considerable nervous irritability and restlessness. From about the fourth day the swelling gradually subsides until the detumescence is complete, which is generally about the seventh day. Soon after the inflammation of the parotids begins to decline, the breasts in females, and the testicles in males, are apt to become much swollen and hard. The subsidence of the disease is usually attended with more or less general diaphoresis, and a red sediment in the urine.

In general, parotitis is neither a severe nor a dangerous affection—more especially when the patient keeps the affected parts moderately warm, and avoids exposing himself to the injurious influence of variable or low temperature. In some instances, however, a sudden metastasis of the inflammation takes place to the brain, or to the testicles, or the mammæ—and this is generally occasioned by the patient taking cold. When it passes to the brain, insensibility, coma, or furious delirium usually supervenes, and death sometimes occurs in a few hours. I have known a case of this kind terminate fatally in less than an hour under a paroxysm of violent convulsions. When the disease thus suddenly falls on the testicles, and the case is not judiciously treated, suppuration of these parts may take place—an occurrence always exceedingly painful, and sometimes ultimately fatal.* The inflammation of parotitis, however, has no tendency to terminate in suppuration; yet, when circumstances favorable to this termination supervene, it does sometimes take place in the parotids, as well as in the external parts, to which it may be transferred.

Children and young persons are most liable to this affection—its occurrence in middle and advanced age being very uncommon. It very rarely occurs more than once in the same individual, and resembles in this respect the other acute contagious maladies.

Treatment.—In mild cases, little more is necessary than keeping the bowels open, and using gentle diaphoretics. The parts should be kept warm—great care must be taken to avoid taking cold. When the inflammatory symptoms are violent, an active antiphlogistic treatment is necessary. When the swelling disappears in the neck, and shows itself in the testicles, a blister should be laid on the parotids, and every effort made to excite a general diaphoresis. To discuss the hard swelling which sometimes remains after the inflammatory symptoms have disappeared, frictions on the tumor, with mercurial ointment, spirits of camphor, or rubefacient liniments, should be used.

Of the Inflammation of the Alimentary Canal.

Inflammation of the mucous membrane of the alimentary canal has, of late years, attracted more attention than perhaps any other phlegmasial affection. The French pathologists, in particular, have investigated this subject extensively and most minutely. Whether their peculiar views concerning the connection of this local affection with general fevers be correct or not, it cannot be doubted that it is pre-eminently entitled to the attention of the pathologist and practitioner. I have already frequently adverted to the great tendency of some forms of fever to give rise to mucous inflammation of the alimentary canal;

* [It is a vulgar opinion, and sometimes a well founded one, that atrophy of the testes is liable to follow a translation of mumps to these organs. One celebrated character was emasculated in this way, and I have known of another case which happened within my own circle of acquaintance.—Mc]

and the practitioner who does not attend to this circumstance will incur a liability to defeat in his remedial efforts which cannot be justified in the present state of pathological science. It is, indeed, of the utmost importance that the medical practitioner should make himself familiar, not only with the general fact just referred to, but especially with the various phenomena, both primary and secondary, of gastro-enteric inflammation. It is not, however, our purpose in this place to treat of this affection in reference to its connection with idiopathic fever. The disease is here considered as a primary affection—the immediate and only cause of the general symptoms which accompany its course, and which necessarily cease with the cessation of the local inflammation.

Sect. IV.—*Of Acute Gastritis.*

Symptoms.—Acute inflammation of the mucous membrane of the stomach commences sometimes with violent vomiting and purging, attended with a burning or lancinating pain in the stomach. In some instances a pricking pain and soreness in the pharynx, without much gastric irritability, are the first symptoms of the disease; and occasionally it begins with great tenderness in the epigastrium, nausea, retching and vomiting. In nearly all instances frequent and painful vomiting, especially immediately after swallowing warm liquids, is a prominent symptom. The desire for *cool* drinks is generally extremely urgent; but the aversion to *warm* liquids is almost equally strong. After each spell of vomiting the patient usually experiences a temporary abatement of the gastric distress; and a similar transient alleviation often follows the reception of cool and bland liquids into the stomach. Warm drinks, on the contrary, rarely fail to aggravate the pain and vomiting as soon as they arrive in the stomach. In some cases there is a considerable difficulty of swallowing, on account of the contracted and irritable state of the upper orifice of the stomach. Oppressed and anxious respiration occurs in many instances, from "the inflamed state of the stomach rendering the descent of the diaphragm painful." (Broussais.) The brain occasionally sympathizes strongly with the inflamed stomach. Broussais has seen patients in this disease "as completely delirious as in fevers of the most malignant character, or phrenitis." The delirium, in such instances, is almost always greatly subdued for a short time by a draught of cold water. Acute gastritis is generally attended with great depression of spirits and prostration of strength; and the pulse, though at first moderately full, soon becomes very contracted, quick and tense, and at last so small as scarcely to be felt. A short and painful cough attends in some cases, and the voice usually becomes much altered, and sometimes entirely extinct from paralysis of the laryngeal muscles. The aspect of the countenance is expressive of great anxiety and suffering, or of despondency and despair.

When the inflammation is confined to the stomach, the bowels are constipated; but where the colon becomes involved in the disease, diarrhœa or tenesmus, with dysenteric discharges, attends. The skin is dry and generally hot, and the tongue often red and clean, or covered with a thick layer of white fur along the middle, with a red and granulated border. Towards the conclusion of fatal cases, hiccough, faintings, cold extremities, slight delirium, coma, and cold clammy sweats occur.

Such are the more prominent symptoms which usually attend this affection. Acute gastritis does not, however, always manifest itself by these unequivocal phenomena. In some instances the inflammation is developed and proceeds to fatal disorganization, in so obscure and insidious a manner as to present scarcely any of the ordinary manifestations of its existence. Dr. Abercrombie* justly observes, that the symptoms which attend acute inflammation of the stomach

* Pathological and Practical Researches on the Diseases of the Stomach. Edinburgh, 1828.

are liable to great uncertainty. The records of medicine furnish us with many instances in which the most striking traces of previous inflammation were detected in the stomach on post-mortem examination, but which exhibited none of the symptoms by which the presence of this affection is usually ascertained.

I have recently met with a case in which the patient complained of intense pain in the head, with occasional slight delirium, transient darting pains through the chest, nausea, with an indescribable feeling of distress in the epigastrium, a frequent, firm and contracted pulse, but without any actual pain in the stomach, or other symptoms that could be regarded as characteristic of gastritis. The patient, in the course of five days, sunk under his malady. On post-mortem examination nearly the whole internal surface of the stomach was found minutely injected, and large patches of the mucous membrane were softened, abraded, and in some parts very conspicuously thickened, and of a yellowish ash-gray color. No other local affections, whether in the abdomen, thorax, or head, were noticed.

Diagnosis.—Acute gastritis, in its ordinary developed character, may be distinguished from cramp and flatulent pains by the following distinctive circumstances. In gastritis the pulse is small, tense, and quick; in spasm, or flatulent pains, it is generally full or nearly natural. In gastritis violent vomiting generally occurs, particularly after taking warm fluids into the stomach. In spasm, vomiting rarely takes place, and warm drinks do not readily excite or aggravate it. The pains seldom intermit in gastritis, except immediately after taking some cool and bland fluid into the stomach, or for a few moments after vomiting. In spasm the pain often intermits wholly for several minutes, independently of the effects of cool drink or vomiting. In gastritis the patient almost always lies on his back, and moves himself as little as possible. In cramp he sits up or walks about, with the body bent forwards, or throws himself about on the bed. The pain in gastritis is burning and lancinating; in spasm it is heavy, twisting, aching and extremely severe. In gastritis the skin is hot and dry; in spasm it is usually moist and rather cool. In gastritis, finally, pressure on the epigastrium is attended with a sense of great soreness, and an increase of the pain; in cramp, pressure generally affords some relief from the violence of the pain.

Causes.—Substances of an irritating or corroding character, received into the stomach; cold water rapidly swallowed when the body is heated, and in a state of free perspiration from fatiguing exercise; over-distension of the stomach by stimulating or indigestible food; stimulating drinks; the external application of cold; the suppression of habitual sanguineous discharges; metastasis of rheumatism and gout; external mechanical injuries of the epigastrium;—all these causes may give rise to acute gastritis.

Besides the foregoing *manifest* causes of acute gastritis, there are others of an *occult* character which appear to possess a specific tendency to excite inflammation of the stomach. Of these, the *miasm* which produces yellow fever is the most remarkable. Acute gastritis occurs, also, very frequently in other forms of malignant fevers, particularly in the putrid typhus of warm climates.

Prognosis.—A gradual subsidence of the pain, and disposition to vomit, accompanied with a lateritious sediment in the urine, spontaneous feculent alvine discharges, a gentle moisture of the skin, and a more developed compressible pulse, indicate a favorable termination. When, on the contrary, the pain and vomiting continue with unabated violence for several days, with difficulty of respiration and hiccough, the pulse becoming smaller, more frequent, and corded, the worst consequences are to be dreaded. If, after the symptoms have continued in this progressive course of aggravation, the pain suddenly subsides, and the extremities become cold and clammy, with dimness of sight and slight delirium, a fatal termination is inevitable.

Post-mortem appearances.—In some instances of great violence, the disease proves fatal before gangrene or disorganization has taken place in the inflamed mucous membrane. Broussais thinks that in such cases death takes place "from

the sole effects of *pain*, and before the inflamed texture is broken down or sensibly altered in its composition. Those who had died in the early stage of the complaint, frequently showed nothing more on dissection than discoloration, without erosion or ulceration of the mucous membrane." In the majority of fatal cases, however, the mucous membrane presents strong marks of disease. It is frequently thickened, dense, and minutely injected, "exhibiting the character of ecchymosis;" erosion and ulceration also are a common occurrence, and in many cases different parts of this membrane are in a softened or broken down state, and of a pale yellow or dark brown color.

Treatment.—Bleeding here, as in the other phlegmasial affections, stands at the head of our remedial means. The smallness and frequency of the pulse must not deter the practitioner from the use of the lancet. On the contrary, when the existence of acute gastric inflammation is unequivocal, this contracted state of the pulse ought to be regarded as the most urgent indication for prompt and copious depletion. In general, all the symptoms remit after an *efficient* abstraction of blood. The remission thus procured is, however, seldom of long duration—an exacerbation usually coming on in an hour or two, demanding a repetition of the use of the lancet.* Next in importance to prompt and copious bleeding, is the application of *leeches*, followed by a large blister over the epigastrium. When leeches cannot be had, a vesicatory, sufficiently large to cover the whole epigastric region, should be at once applied; for as four or five hours must elapse before the blister can inflame the skin, sufficient time is allowed to moderate the momentum of the circulation, and the general phlogistic state of the system, by prompt and copious depletion, to obviate any injurious consequences from the general stimulating effects of the blister. The blister should be dressed with mercurial ointment.

The ordinary internal antiphlogistic remedies, such as nitre, antimonials, and cathartics, are entirely inadmissible in this affection. Considerable advantage may be obtained from the free use of mild mucilaginous drinks, such as flaxseed tea, infusion of althea, or of marsh-mallows, or of the common *malva rotundifolia* of this country, thin barley-water, or a solution of gum Arabic in water. I have used an infusion of the slippery-elm bark, in a few instances, with much apparent advantage. The *vegetable* acids, diluted with some bland mucilaginous fluid, sometimes relieve the gastric distress considerably, more especially the lemon-juice. Broussais says, that "orange-juice, diluted in water, forms an excellent drink in this disease." The *mineral* acids are always injurious.

Costiveness must be obviated by laxative enemata; and this should be particularly attended to, throughout the whole course of the disease. For this purpose, we may use the following:

℞.—Ol. ricini ℥ij
Sapon. venet. ʒj.
Infus. sem. lini ℥viij.—M. fiat enema.

Opium is a valuable remedy in this affection. After the general phlogistic condition of the system has been considerably moderated by venesection, full doses of opium rarely fail to allay the pain and vomiting, and to excite a general and salutary action of the cutaneous exhalents. "Opium," says Dr. Armstrong, "when given in health, constipates the bowels; but this is so far from being the case in gastritis and enteritis, that it tends to assist the action of purgatives, and, when exhibited in conjunction with proper depletion, it may be fairly accounted one of our best remedies. The two most remarkable effects of full doses of

* Broussais does not seem to place a great deal of reliance on the employment of venesection in this affection. "La saignée," he observes, "n'éteint point un phlogose de l'estomac, comme elle emporte un peripneumonie, et qu'elle est inutile sans le concours des emolliens. J'ai eu assez lieu de me convaincre que les évacuations sanguines sont d'un bien faible secours *dans les inflammations des organes plats et membraneux, lorsque ces tissues ne sont point appliqués sur un parenchyme.*"—*Phlegmas. Chron.*, vol. ii. p. 20.

opium in gastritis, are relief of the pain and reduction of the pulse; so that the patient often falls asleep shortly after their exhibition, and the pulse which had been previously small and quick, will become full and small." Some writers recommend the use of this narcotic in combination with calomel in the present disease. "Pills, with a grain of calomel and a grain of opium, administered three or four times daily, will be found sometimes to allay pain and arrest inflammatory action in acute gastritis."* I have myself sometimes employed this combination with great advantage. When opium is employed in this affection, it ought to be given in large doses, and repeated so as to keep up a continued impression on the system. In two of the most decided cases I ever saw, two grains of opium were administered every three hours, until eight grains were taken, and with the happiest effects. Efficient blood-letting, both general and local, should always be premised to the employment of this narcotic.†

During convalescence from this disease, the utmost care is necessary to avoid taking solid and stimulating articles of food and drink. Nothing but the blandest liquid nourishment should be allowed—such as oatmeal, gruel, boiled milk, barley-water, beef or chicken-tea, or preparations of arrow-root, sago, rice, or tapioca.

Sect. V.—*Of Chronic Gastritis.*

Chronic Inflammation of the mucous membrane of the stomach is one of the most common phlegmasial affections. The worst forms of dyspepsia, and all that host of inveterate gastric and bilious disorders of which so much is heard, and the true nature of which is so often misunderstood, are in nine cases out of ten the consequences of a chronic inflammatory condition of the lining membrane of the stomach. The slow and insidious progress of this grade of gastric inflammation during its early period, is indeed well calculated to elude observation, and to lead to a misapprehension of its true character. In many cases the first symptoms are those which usually characterize indigestion—such as acidity, flatulence, a sense of heaviness and oppression after eating, eructations, and transient slight pains in the region of the stomach. When the stomach is empty, the patient feels easy, but generally languid and dissatisfied, and often tormented with a craving and capricious appetite for food. As the disease advances, the epigastrium become somewhat tense, and sore to the touch, and nausea or vomiting is apt to occur an hour or two after taking food. The gastric distress gradually becomes more and more troublesome, particularly after eating; the patient complaining of a constant distressing sensation, amounting sometimes to actual pain in the epigastric and right hypochondriac region. The pain in the stomach is generally confined to a circumscribed spot, and is of a lancinating and stinging character. A sensation of pressure against the diaphragm, as if by a large ball, is occasionally experienced by some patients, whilst others complain of a feeling as "if a bar were fixed across the stomach, preventing the passage of food or drink into the stomach." (Broussais.) In some instances, a fluid resembling the white of eggs is copiously thrown up from the stomach, and many complain of a constant and most painful feeling of pyrosis. (Abercrombie.)

* A Compendium of Theoretical and Practical Medicine. By David Uwins, M. D., 1828.

† [I have lately been called into consultation in two distressing and dangerous cases of acute gastritis—in both of which speedy and permanent relief was afforded by the administration of full doses of the nitrate of silver. Half a grain was given in a pill with one grain of ext. hyoscyami at short intervals, until every symptom was allayed. In the case of a lady, whom I attended with my brother, Dr. Samuel McClellan, and Dr. Shallcross of this city, immediate relief was afforded to the most painful and incessant vomiting, and a long-continued sense of a lump of red hot iron on the stomach. This patient had begun to sink into hopeless prostration and coldness, and actually threw up considerable quantities of the real black vomit in the course of her attack.—Mc.]

Andral mentions a case in which four pints of a glairy fluid were thrown up every twenty-four hours, without any portion either of the food or drinks she took coming off with it. In the advanced periods of the disease, the appetite almost always fails entirely, and in very aggravated cases "there is a general abhorrence of food." Costiveness almost universally attends the disease in the first periods of its progress; but in many instances diarrhœa ultimately ensues, accompanied with tormina, and sometimes with mucous and bloody stools, and more or less tenesmus. The patient is generally dejected, morose, impatient, of an irritable temper, and "but little disposed to enter into a detail of his sufferings." In general, the cheeks and prolabia are of a deep red color, the tongue is often clean, smooth, and of a vermilion tint over the whole anterior surface, or red and granulated, "somewhat like the points upon a strawberry, with deep fissures, or covered with a streak of brown fur along the middle, with red and clean edges." In the advanced stage of the disease, emaciation always goes on rapidly, the cellular and adipose structures becoming almost entirely absorbed; in inveterate cases the skin is brown, inclining to yellow, and is drawn tightly over the muscles, sinking into their interstices, so as not to be pinched up without much difficulty, even where it usually is most relaxed. (Broussais.) In some instances a slight cough attends, but the function of respiration is rarely much disturbed. The pulse is generally quick, and more or less tense, though not often accelerated in the beginning, except soon after eating; but in the latter periods it becomes contracted, hard, and frequent. There generally exist much muscular prostration, and great indisposition both to bodily and mental exertion. The disease often continues for many months, gradually acquiring strength as it advances, until the system becomes exhausted under a wasting and slow irritative fever, and life is extinguished.

Chronic gastritis is not always marked by symptoms so conspicuous as to render its existence very obvious. The inflammation sometimes proceeds in so obscure a manner as to terminate in fatal disorganization, with scarcely any accompanying manifestations of a serious import. I attended a child which appeared to labor only under trifling gastric derangement, with occasional slight febrile exacerbations. Death occurred unexpectedly in the third week of its indisposition; on dissection, a large circular spot of the mucous and muscular coats of the stomach was entirely softened and broken down, and of a yellowish-gray color. Andral has related several cases illustrative of the insidious progress of this malady. In one case no suffering or uneasiness in the stomach was complained of by the patient until eighteen hours before death.

In some cases, after a few weeks, or perhaps months, of slight uneasiness in the stomach, sudden vomiting with prostration and violent pain in the epigastrium occurs, and speedily terminates in death, *under symptoms of peritonitis*, in consequence of the unsuspected inflammation in the stomach perforating its coats, and giving exit to its contents into the cavity of the abdomen. When the inflammation terminates in perforation of the stomach, death generally occurs from the sudden supervention of peritonitis. In such cases, after an indefinite period of gastric disturbance, sudden and extremely severe pain occurs in the epigastrium, attended by vomiting or retching, "as if some acrid poison had been taken into the stomach." Chronic gastritis is frequently connected with more or less phlogosis of the superior portion of the intestinal tube.

Causes.—Chronic gastritis may be the consequence of the acute form of the disease; but it is much more commonly the result of irritating substances acting immediately on the internal surface of the stomach;—such as indigestible, heating, or irritating articles of food and condiments; acrid medicinal substances; insufficient and innutritious articles of food, in conjunction with habitual exposure to damp and cold situations, or mental despondency; the intemperate use of alcoholic liquors; repelled cutaneous eruptions; suppressed habitual discharges; neglected or ill-managed dyspepsia.

The depressing mental emotions, if they do not actually excite the disease, are

among the most powerful *predisposing* causes of this distressing malady. The united influence of despondency and crude innutritious food appears to be peculiarly apt to give rise to this grade of gastric inflammation. The development of the disease is often very gradual, commencing in mere debility of the digestive powers, which, without great attention to dietetic rules, leads to irritation, and finally to chronic inflammation of the internal surface of the stomach. Over-distension of the stomach by food or drink, especially when habitual, and when the ingesta are of a stimulating character, is a common source of this affection.

Diagnosis.—In its early periods, chronic gastritis may be readily mistaken for dyspepsia; for its symptoms often differ but little from those which occur in the latter disease. When, however, the patient feels considerable pain *in a particular spot*, followed by vomiting soon after eating, and a severe feeling of pyrosis attends, with redness and tenderness of the tongue and throat, and the patient becomes much weakened and emaciated, we may reasonably suspect the existence of chronic gastritis.

Considerable difficulty often exists, in distinguishing chronic gastritis from *gastralgia*—a neuralgic affection wholly unconnected with inflammation. There can exist no doubt that this malady has been frequently mistaken for chronic gastritis; and as the modes of treatment appropriate to each are diametrically opposite, it is manifestly of the utmost importance to learn to distinguish them from each other.

Mr. Barras has published some interesting observations on gastralgia, and on its liability to be mistaken for *chronic gastritis*. He gives the following, among others, as diagnostic symptoms between these two affections.*

1. "In *chronic gastro-enteritis*, the pain is generally *obtuse;* often felt only on pressure; is never absent. *Gastralgic* pain, on the other hand, is often extremely violent; is often, when most violent, relieved rather than increased by pressure. It often radiates from the epigastrium towards the thoracic parietes, the back, and the shoulders; is of an intermittent character, sometimes entirely disappearing, to return with more or less violence.

2. "In *chronic gastritis*, the tongue, which is generally *red on the sides and at the tip*, is covered in the middle with a kind of dry mucous crust, resembling a false membrane; the breath is fetid, with a bitter taste in the mouth; there is thirst. In *gastralgia* the tongue is white; saliva abundant; no thirst, but sometimes a repugnance even to liquids.

3. "In *gastritis*, the appetite is *always* bad, and sometimes amounts to a universal disgust for every kind of food. In *gastralgia*, the appetite is variable, null, slight, natural, often greater than in health.

4. "In chronic gastritis, the ingestion of a small quantity of food renews the patient's sufferings; excites a febrile movement in the system, and the digestion is always imperfect. There is often rejection of the food by vomiting a little time after eating; or if there be no vomiting, the patient is oppressed, during the digestive process, with a sense of weight, distension, nausea, acid, or acrid eructations, and irritation of the bowels, or diarrhœa, in the advanced stages. In some cases of *gastralgia*, the pain is relieved, at least for a time, by eating food in considerable quantity, and the digestion is complete, or even too quick. In most cases of gastralgia, however, the presence of food in the stomach renews the pain; but not till some time after eating; generally, one, two, or even three hours; at which time the patient experiences weight and malaise at the epigastrium, as if a foreign body were lodged in the stomach. There are nausea, borborygmi, flatulent colic, eructations of air, but without fetor or causticity. Sometimes, indeed, patients will taste the aliments that they have swallowed in the air which they eructate, but the digestion is completed, and diarrhœa is very rare. Constipation is generally obstinate, and the urine, especially when the gastralgia

* Revue Médicale, November and December, 1825.

is in a high degree, is usually pale, voided frequently, and in small quantities at a time.

5. "Chronic gastritis never fails to impair the process of nutrition, inducing hectic fever, characterized by hardness and frequency of the pulse, heat of the skin, and evening exacerbations, with loss of flesh and strength, sallowness of the countenance, with a peculiar dark tinge, and finally death.

6. "In some violent and prolonged cases of *gastralgia*, the patient experiences difficulty of breathing, palpitations of the heart, wandering pains, and peculiar sensations of coldness, especially in the arms, loins, and lower extremities. The sleep is sometimes good, sometimes agitated, sometimes null; yet, in the mornings, the patient gets up refreshed, and feels quite well till breakfast renews the gastric sensibility. Nothing of this kind obtains in latent *gastritis*.

7. "Those who are affected with chronic inflammation of the digestive tube are melancholy, morose, and impatient; but this is nothing to the state of moral depression and anxiety which obtains in *gastralgia*. In this last there is ineffable despondency; disgust of life, or fear of death in the extreme; the slightest sensation in the stomach awakens the patient's terrors; he is tremblingly alive to every look of his physician—to every word which is spoken by his friends respecting his complaint; he is afraid of taking anything into his stomach, as he knows, by doing so, he will aggravate the complaint; he is convinced that his disease is mortal—becomes entirely absorbed by his own sensations, and indifferent to everything else. But any diminution or sensation of the gastralgia immediately changes the scene from despair to sanguine hope—to be again reversed on the slightest accession of pain."

Dr. Armstrong observes, that the effects of a diffusible stimulus—such as wine, brandy, &c., will generally remove all doubts as to the presence of the one or the other of these affections. In *gastritis*, the pain and uneasiness in the stomach are always increased by potations of this kind; whereas, in gastralgia, relief is generally the result.* Whenever fever, pain, and anorexia occur after the operation of an emetic, we can no longer doubt the existence of chronic gastritis.—(Broussais.)

Post-mortem appearances.—The organic changes effected in the stomach by chronic inflammation of its villous coat are very various. In almost all fatal cases more or less ulceration is found in the stomach; and these ulcers exist in various forms and stages of progress. Sometimes a single ulcer, not above a quarter of an inch, occurs, the other portions of the mucous membrane being in a healthy condition. Occasionally we find various ulcers—some partly cicatrized, others just beginning, and others again, deep with loss of substance, and rounded and elevated edges. When the ulcerated surface is large, there are "generally thickening and induration of the coats and fungoid elevations." (Abercrombie.) Sometimes the only organic lesion consists in a thickening of the mucous membrane, in different parts of its extent, of a pale ash, or brown, or dark color resembling melanosis. In other instances portions of the mucous membrane are softened or broken down, or entirely destroyed.† Cases occur, however, in which no organic changes whatever are detected in the mucous membrane on dissection. In instances of this kind the subjacent cellular tissue, says Andral, is found in a diseased state—and this is particularly observable in that condensed and whitish membrane between the villous and muscular tunics of the organ. (*Med.-Chir. Rev.*) Andral observes, that thickening and induration of the mucous membrane are one of the most certain marks by which *chronic* may be distinguished from *acute* gastritis. Softening of this membrane is, how-

* The Morbid Anatomy of the Bowels, Liver and Stomach. Fasciculus, i. and ii., London, 1828.

† Pathological and Practical Researches on Diseases of the Stomach, &c. By John Abercrombie.

ever, the most frequent of all the organic changes effected in this disease.* In some unequivocal cases of chronic gastritis, M. Andral found nothing but stripes of thickened and condensed mucous membrane, and of a *paler color than natural.* In one very strongly-marked case, nothing but a patch of a milky white color, with slight thickening and induration of the mucous membrane, was discovered on the stomach on dissection.

Treatment.—In the treatment of this variety of gastric inflammation, almost everything depends on proper dietetic regulations. It is obvious that everything which tends to irritate the stomach must be particularly calculated to favor the progress of the disease, and to aggravate the sufferings of the patient. It is, therefore, of the utmost importance, in the remedial management of this affection, to allow nothing in the way of nutriment but the blandest and least irritating articles of diet that can be contrived. Mucilaginous liquids, such as decoctions of barley, rice, thin gruels, and fluid preparations of arrow-root, tapioca, or sago, or boiled milk, and animal jellies, constitute the appropriate nourishment for patients affected with this disease. All solid articles of diet should be especially avoided.

Leeching or cupping over the region of the stomach is another of our most efficient means for subduing this distressing affection. Much benefit will also sometimes accrue from the application of a blister to the epigastrium; or, what has appeared to me still more useful, frictions with tartar emetic ointment until pustulation is produced. Leeching and blistering should be used, from time to time, in alternation.

Among the internal remedies useful in chronic gastritis, the *sulph. ferri* is, probably, the most valuable. Dr. Abercrombie speaks very favorably of its effects in this complaint—and Dr. Armstrong recommends it as a remedy of considerable value. Within the last two years, I have employed it in several cases with very decided advantage. Dr. Abercrombie administers it in doses of two grains, with a few grains of aromatic powder, twice or thrice daily. I have never given more than one grain at a dose, and indeed very seldom more than half a grain. It has appeared to me most beneficial when given in union with the extract of hyoscyamus. Half a grain of the sulphate with a grain of this narcotic, and an eighth of a grain of sulph. morphia, may be given four times in the course of twenty-four hours. I have also employed the *nitrate of silver*, in small doses, with very evident benefit in cases of this kind. It should be administered with a considerable portion of some bland mucilaginous fluid. In a case for which I lately prescribed, very excellent effects were obtained from the use of five grains of powdered borax, in union with four grains of Dover's powder, three times daily. Balsam copaiva has been particularly recommended in chronic inflammation of the alimentary canal. In small doses, I have used the following mixture, in a few well-marked cases of this complaint, with considerable benefit.

℞ —Bals. copaiv ℥iss.
P. g Arab ℥ij.
Syrup. limonis ℥ss.
Aq. fontanæ ℥viij.
Tinct. opii acetat. gtt. xxx.—M. S. A small tablespoonful twice daily.

To palliate the distressing sensations in the stomach, as well as the general irritability both of mind and body, two or three grains of Dover's powder may be given at night on going to bed. For this purpose I have employed the lupuline with much benefit. From four to six grains of this preparation may be given once daily. The syrup of poppies may also be advantageously used, as an occasional anodyne in this affection.† Care must be taken to procure regular alvine evacuations. This, however, cannot be prudently effected by laxatives

* Memoir sur les Caractères Anatomiques de la Gastrite Chronique. Par M. Andral, Repertoire Générale, Nos. 1 and 2, 1824.—*See Med. Chir. Rev.*, Jan., 1827.

† [The nit. arg is infinitely the best remedy in this state.—Mc.]

taken into the stomach; for, however mild they may be, they will almost inevitably do mischief by irritating the morbid mucous membrane of the stomach. One or two purgative enemata, *administered at stated hours* daily, rarely fail to procure all that may be desired in this respect.

Sect. VI.—*Of Acute Enteritis.*

Acute inflammation of the intestinal canal occurs under two forms, sufficiently distinct in their pathological characters and phenomena to require separate consideration. In one of these varieties, the inflammation is seated chiefly, perhaps in some instances exclusively, in the *peritoneal* and *muscular* coats of the intestines; and in the other, the inflammation is confined wholly, or in a great measure, to the internal or mucous membrane. In the first, *constipation* is almost universally present; in the second, mucous discharges, with more or less blood and tenesmus, are rarely absent.

1. *Acute Peritoneal Enteritis.*

Symptoms.—This disease often commences with a feeling of uneasiness in some part of the abdomen, terminating, after a longer or shorter period, in a fixed aching or burning pain, referred usually to the umbilical region. In some instances, the pain is confined to a circumscribed part; but it more frequently becomes diffused throughout the whole abdomen. *Obstinate constipation almost invariably exists*—except the inflammation extends to the mucous membrane of the colon or rectum, which, however, occurs but very rarely, when dysenteric discharges, with tenesmus and tormina, attend. Nausea and vomiting are frequent and very distressing attendants on the disease; the latter often becoming so constant and violent as to communicate the inverted action of the stomach to the bowels, causing stercoraceous matter to be thrown up. The tongue is dry, and generally covered with a white fur, sometimes of a pale red round the edges, with a streak of brown fur along the middle; the thirst is urgent; the urine scanty, high colored, and frequently discharged with considerable difficulty; the skin hot and dry on the trunk of the body, but often moist on the forehead and in the palms of the hands; the pulse small, frequent and tense; and the respiration almost always more or less disturbed—being usually short, anxious, and performed by the action of the intercostal muscles exclusively. To avoid pain from the pressure of the abdominal muscles on the inflamed bowels, the patient lies on his back, with the knees drawn up, and the shoulders raised by pillows, by which the tension of these muscles is diminished. Sometimes acute peritoneal enteritis is ushered in "by a sort of rigor," exhibiting, in its subsequent course, two distinct stages—one of excitement, and the other of collapse, resembling, in this respect, acute peritonitis. In the stage of collapse, the extremities become cold, and at last damp, "while the fingers and hands are generally mottled by a dun sort of redness here and there." The pulse becomes weaker and weaker, until it feels under the finger "like a soft undulating line." Great prostration of the muscles exists; the "face becomes death-like; the abdomen tumid and tense;" and, lastly, a sort of passive gulping generally takes place, the contents of the stomach being apparently forced up the œsophagus by the pressure of the intestines, which are then, for the most part, enormously distended with flatus.*

Peritoneal enteritis is generally rapid in its course, and is peculiarly prone to terminate in gangrene. When this termination is about taking place, the pain suddenly subsides; the pulse sinks rapidly; the countenance becomes pale and cadaverous; the extremities cold; the surface covered with a cold clammy

* Armstrong's Morbid Anatomy of the Bowels, Liver and Stomach, &c.

sweat, and hiccough, slight delirium, and occasionally convulsions, close the scene. This affection is seldom protracted beyond the seventh or eighth day, without terminating either in resolution or in death.

Diagnosis.—When the inflammation is seated in the arch of the colon, peritoneal enteritis may simulate pleuritis or hepatitis. From these affections it may be distinguished by the following circumstances:—In pleurisy, the pulse is *full*, hard, and active—in enteritis, it is contracted, corded, quick, tense, and frequent. In pleurisy, the respiratory motion of the thorax is not conspicuous, the act of respiration being performed wholly by the diaphragm and the abdominal muscles—in enteritis, on the contrary, the chest is regularly and strongly dilated and contracted by the action of the intercostal muscles, whilst the abdominal muscles and the diaphragm are quiescent. In pleurisy, the pain is aggravated by pressure on the intercostal spaces, but abdominal pressure causes little or no suffering—in enteritis, the reverse obtains, abdominal pressure causing much aggravation of the pain, whilst pressure on the intercostal spaces gives no particular uneasiness.

"From simple peritonitis, enteritis differs by the presence of vomiting, and obstinate constipation of the bowels. The pulse also is more permanently frequent, and the pain more violent and constant, often resembling the tormina of ileus."*

From spasmodic pain of the bowels, enteritis is readily distinguished by the following signs:—In enteritis, the patient lies quietly on his back, moving himself as little as possible—in colic, he throws himself about almost continually. In enteritis, abdominal pressure aggravates the pain—in colic it often relieves it. In the former affection the pain is continuous—in the latter, it frequently intermits entirely for a short period. The skin in enteritis, is hot and dry—in colic, it is seldom above the natural temperature, and generally moist. In colic there is rarely any thirst—in enteritis almost always.

It has already been stated that in the present variety of enteric inflammation, the chief, and sometimes perhaps the exclusive seat of the disease, is in the external peritoneal covering of the intestinal canal, though the muscular coat, no doubt, very generally participates in the inflammation. In some cases, it would seem, the inflammation commences in the internal or mucous membrane, and after a longer or shorter period, leaves this structure to fix itself on the muscular and peritoneal tunics. (Armstrong.)

The existence of obstinate constipation in enteric inflammation may be regarded as a pretty certain sign that the disease is seated in the peritoneal and muscular coats of the bowels, or in one or the other of these tunics separately, Abercrombie† asserts, that in *peritoneal* enteritis, the peristaltic action of the bowels is not particularly affected; and that, whenever obstinate resistance to the operation of purgatives exists, the *muscular* coat is the seat of the inflammation. This does not entirely accord with general experience; for it is well known that constipation is scarcely ever absent in every variety of peritoneal inflammation. Without doubt, inflammation of the *muscular* coat will always be accompanied with more or less inactivity of the bowels; but the mere absence or presence of constipation cannot be viewed as distinctive of muscular and peritoneal inflammation in enteritis. It is, indeed, probable that peritoneal and muscular inflammation are almost always concomitant in this affection; and all attempts to assign appropriate symptoms to each separately, must be fallacious, and, indeed, of no practical usefulness whatever. Nevertheless, the presence of costiveness or diarrhœa affords us a good diagnostic between *mucous* and peritoneal, or peritoneo-muscular inflammation in enteritis. "In proportion as the force of the inflammation is directed upon the peritoneal and muscular coats of

* Abercrombie on the Diseases of the Stomach, &c.

† Pathological and Practical Researches on the Diseases of the Intestinal Canal. Edinburgh, 1828.

the intestines, *constipation* prevails; and, on the contrary, when irritation or inflammation is seated in the mucous membrane, diarrhœa or dysentery obtains." (Dr. James Johnson.)

Post-mortem appearances.—The only favorable termination of peritoneal enteritis is in resolution—and this termination is frequently attended by a moderate diarrhœa. Suppuration is a rare occurrence in this affection. I have lately, however, met with an instance in which this termination occurred. Its most common fatal termination is in gangrene. But it would seem, from the observations of pathologists, that this disease sometimes terminates fatally, without the occurrence either of suppuration, effusion, or gangrene, or without any perceptible structural changes, (Wilson, Broussais, Abercrombie,) and merely "from the general irritation and lesion of function."

In some cases of extensive inflammation of the external tunic of the bowels, coagulable lymph is thrown out, and adhesions formed between the different folds of the intestinal tube, so as to agglutinate the bowels in some instances, into a round and firmly adherent mass. This mode of termination is usually accompanied by more or less of a sero-purulent fluid in the cavity of the abdomen, attended sometimes with masses of a fatty substance resembling soft butter, deposited in the cavities formed by the folds of the intestines—an instance of which occurred not long since to Dr. Hartshorn and myself.

Causes.—Peritoneal enteritis may be produced by an accumulation of indurated feces in the bowels; by spasm; external mechanical injuries; hernia; drastic purgatives; sudden suppression of perspiration from cold; standing long on cold and damp ground; metastasis of external inflammations; of gout—rheumatism, erysipelas, &c.; intussusception, worms, wounds, &c.

Prognosis.—This disease is always to be regarded as one of very considerable danger. A very contracted or scarcely perceptible pulse, attended with cold hands and feet; or an extensive diffusion of the pain throughout the abdomen, more especially when, at the same time, the abdomen becomes tumid, tense, elastic, and extremely tender to pressure, indicates great danger. Very frequent and violent vomiting is also a very unfavorable sign; for, independent of the additional irritation and suffering which it causes in the inflamed structures, it contributes, in no small degree, to increase the general prostration, and prevents, moreover, the retention of both remedial and nutrient articles into the stomach. Hiccough, in the early period of the disease, is not indicative of particular imminent danger; in the advanced stage it comes in the train of fatal symptoms, manifesting the supervention of gangrene. An expanded state of the pulse may be regarded as a favorable sign—the degree of violence and danger corresponding generally with the degree of contraction and obscurity of the pulse. After all, the prognosis in this affection is always attended with much uncertainty. I have seen patients recover from this disease after most of the above unfavorable symptoms had made their appearance; and, on the contrary, several deaths have occured from this affection, in my practice, most unexpectedly, when no particular unfavorable symptoms were present.

Treatment.—In the commencement of the disease, prompt and efficient blood-letting is the remedy upon which our hopes of success must be mainly placed. The first bleeding should be carried to the extent of producing a decisive impression on the system. After the violence of the disease has been thus checked, smaller bleedings should be repeated from time to time, so as to keep up the impression made by the first. The success of medical treatment in this affection depends in a great measure on promptly breaking down the violence of the inflammation during the first twenty-four hours, and nothing can contribute so much to this desirable effect, at this early period of the complaint, as efficient blood-letting.

Writers have expressed different opinions with regard to the utility of local bleeding by leeches, in this, as well as in other acute inflammations within the cavity of the abdomen. Abercrombie observes, that "leeches are entitled to no

confidence, except when the affection is limited, or the strength unable to support constitutional measures." In the beginning of the disease, little or no advantage will result from this mode of depletion, but after the violence of the inflammation has been subdued by decisive venesection, leeching over the seat of the pain is unquestionably a very important auxiliary. The removal of blood in this way must at least tend to sustain the antiphlogistic impression made by the previous general bleeding, and it may be practised with advantage where the propriety of further venesection may be doubtful.

Purgatives, under proper management, are decidedly useful in this affection. The more *drastic* articles of this kind, however, should be avoided, as they rarely procure adequate evacuations, and frequently do mischief by exciting much sickness, vomiting, and tormina. In two instances of this disease, reported by Dr. Abercrombie, a relapse was the consequence of the use of drastic purgatives. He thinks himself warranted, from the results of his experience, to conclude that purgatives are apt to prove detrimental in the early period of enteritis, and in this opinion Dr. Johnson seems inclined to agree with him. In the early stage of the disease, laxative enemata ought to be used; and I have known considerable advantage derived from the copious injection of warm water, rendered slightly mucilaginous by starch or flaxseed, into the bowels. *Laxatives* of the milder kind, when judiciously managed, are, however, not only perfectly harmless, but generally unequivocally beneficial in this malady. But even these should not be administered until a strong impression is made on the system by blood-letting. After proper depletion has been made, the intestines ought undoubtedly to be evacuated by the administration of laxatives; and for this purpose calomel, with castor oil and *opium*, will generally answer perfectly well. Two grains of opium, with five or six grains of calomel, may be given every two hours. As soon as the abdominal pain is allayed, and the skin becomes soft, effects which almost invariably follow the use of this anodyne, an ounce of castor oil should be given, and repeated in half ounce doses every two hours, until the bowels are freely evacuated. Should this plan fail to excite purging, enemata must be given to promote the operation of the oil. One of the best injections for this purpose is spirits of turpentine, mixed with some mucilaginous fluid. Thus:

℞.—Ol. terebinth. ℥j.
Vitelli ovi, No. ii.
Infus. sem. lin. tepid. ℥xvi.—M. ft. enema.

When this is effected, another full dose of opium must be administered, and quietude enjoined. It is to be recollected, however, that the use of this valuable narcotic is to be restricted altogether to the advanced period of the disease, when the general and local inflammatory excitement has been in some degree broken down by sanguineous evacuations; for at an earlier period it could hardly fail proving injurious.

Nothing need be apprehended from the ordinary constipating effects of opium in this disease. This article, on the contrary, is in general the best means we possess for favoring the operation of purgatives in enteritis. It lessens the extreme irritability and sensibility of the inflamed intestines, and thereby prevents purgatives and the usual contents of the bowels from exciting them into inordinate contraction, the principal cause perhaps of the constipation. Drs. Armstrong and Johnson have done much towards removing the prejudices so generally entertained against the employment of opium in some of the phlegmasial affections. The former of these eminent writers states, "that his attention was drawn to this subject by observing a chasm or defect in the common modes of treating acute abdominal inflammation by the simple depletion of bleeding and purging. He had long observed, that when in affections of this kind opium was given in full doses, immediately after copious depletion, the cases terminated successfully. Within the last four years he has prescribed large doses of opium, after adequate blood-letting, in at least a hundred cases of acute and subacute

inflammation in the abdomen, and always with obvious advantage." In acute peritoneal inflammation of the stomach and bowels, he makes it a rule to bleed in the first stage, until syncope approaches. As soon as the patient recovers from the faintness caused by the first bleeding, three grains of opium are administered and quietude enjoined. "The effects of opium thus administered are to prevent a subsequent increase in the force and frequency of the pulse, and a return of abdominal pain, while it induces a tendency to quiet sleep, and a copious perspiration over the whole surface. If in three or four hours after the opium is taken, there is pain on pressure in any part of the abdomen, with a hot and dry skin, and a quick jerking pulse, I order the patient to be immediately bled in the same decisive manner."* Dr. Johnson,† in remarking on a fatal case of enteritis, observes: "Medical men now-a-days trust too exclusively to sanguineous evacuations in enteritis, and neglect certain and powerful auxiliaries which they would do well to call to their aid. If, when they have bled copiously, and as far as the patient's strength will bear, they will exhibit opium in combination with calomel, they will have the satisfaction of saving many lives. This has been my practice, and I know it to be the successful practice of one of the first hospitals of London." Schmidtmann, one of the most experienced of the German physicians of the present day, observes, that *opium* deserves to be considered as among the most powerful anti-enteric remedies. He particularly recommends the exhibition of this narcotic, in union with calomel, and asserts that since he became acquainted with the valuable powers of this combination, he has not found it necessary to draw so much blood as before.‡ In my own practice I have had repeated and decisive evidence of the usefulness of opium, not only in the present, but in many other of the phlegmasial affections. When given in diseases of this kind, it ought always to be used in large doses—from two to four grains after suitable evacuations, so as to allay the pain, and with it the general sympathetic irritations of the system.

Blisters applied to the abdomen, after the local and general inflammatory action has been in a measure subdued by venesection, are powerful auxiliaries in the treatment of enteritis. Fomentations, also, or large emollient poultices applied on the abdomen, will occasionally procure considerable advantage in this affection. Some writers strongly recommend *tobacco* injections in enteritis—(Abercrombie:) and they certainly tend in no small degree to diminish the mo-

* Transactions of the Associated Apothecaries and Surgeons Apothecaries, of England and Wales, vol. i. art 3.

† In his remarks on Dr. Scott's case of fatal cystitis hepatica, (*Edin. Journal*, April, 1825,) Dr. Johnson uses the following language, in relation to the employment of opium in inflammatory affections: "We reiterate what we have often said before, that practitioners are too much afraid of opium in inflammations, especially of the abdominal viscera. Yet, after copious bleeding, there is not the smallest danger in its administration, especially if combined with calomel. But practitioners seem, in general, to have but one idea in inflammation—depletion—depletion. All other considerations are absorbed in this. The pain, and its consequences on other organs and systems, go for nothing. Bleeding and purging are the catholicons. The *quantity* of opium should never be considered in such cases, but only the *effect*. It must be given so as to subdue pain and irritation, whatever may be the magnitude of the dose."—*Med.-Chir. Rev.*, July, 1825, p. 223.

‡ Dr. S. expresses himself in the following manner, in relation to the use of opium in this affection:

"Ex quo hoc (connubium calomelis et opii) in usum verto in curanda enteritide non tot mihi opus est phlebotomis, quam olim, cum potens hoc remedium ignorarem.

"Vix enteritidis curationem adgressurus essem sine opio. Et mihi videtur, idem, præmissis præmittendis, inter potentissima antienterica numerandum esse. Notum enim est, inflammationem irratione, procreari, atque fibras viventes extimulatas majoram exserere conatum oscillandi et se movendi: ex quo sequitur, in enteritide motum peristalticum augeri et accelerari; quod vomitas sæpe enormis, ut plurimum cum ea conjunctum est, inflammationem actione et motu fibrarum partis adfectæ exasperari, eandem autem quiete et vacatione a motu deliniri et compesci. Cum jam opio motus intestinorum vermicularis retardetur et imminuatur; ideo in enteritide ab eo princeps auxilium expectandum est: quocum experientia pulchre conspirat."—*Summa Observationum Medicarum. Auctore L. J. Schmidtmann.* Berlin, 1821, vol. ii. p. 110.

mentum of the circulation, and to excite alvine evacuations, effects which are especially desirable in this affection. From the great aptitude of tobacco to produce extreme relaxation and prostration, as well as sickness of the stomach, great caution is necessary in the employment of this article, lest sudden and alarming depression be induced. An injection of this strength may be used without apprehension of mischief from its depressing influence:*

℞.—Folor. tabaci ℈ij.
Aquæ ferventis ℥xvj.—M. The half of this will be sufficient for one enema.

The ordinary internal antiphlogistic remedies, such as nitre, antimony, spiritus mindereri, &c., are not only useless, but almost always decidedly injurious. *Digitalis* may be used with advantage in the advanced periods of the disease, when the inflammation has nearly subsided, and the pulse still remains in an irritated condition—namely, quick, frequent, and sharp. The best way of giving this article is in the form of powder, of which from a quarter to half a grain may be given every hour or two, until its influence on the action of the heart is manifested in the reduction of the pulse.

When the symptoms which are known to announce and accompany the occurrence of gangrene supervene, we should not immediately abandon all hopes of the patient's recovery, or cease our efforts to save him. In instances of this kind the exhibition of stimuli will occasionally speedily remove every dangerous symptom. I attended a man during the present year, affected with acute enteritis; on the sixth day of the disease the pain ceased, his pulse became extremely small and weak, and the hands and feet of an icy coldness, and damp, with great muscular prostration. I supposed gangrene had taken place—announced to the patient's friends his speedy and inevitable dissolution, and directed all remedial efforts to be discontinued, with the exception of the use of wine and water as freely as he might desire to take it. Instead of finding him dead, as I expected, on the following morning, he was so much better as to leave very little doubt of his final recovery, an event which was happily realized. Abercrombie has recorded a case of this disease, in which the importance of attending to this fact was strikingly illustrated.†

Mild and mucilaginous diluents may be freely allowed, unless they distress the stomach, or excite sickness.

During the period of convalescence, the patient should abstain entirely from every kind of stimulating or indigestible food. Nothing but the mildest and least irritating articles of diet should be used for several weeks after recovery. The slightest error committed in this way is apt to renew the intestinal inflammation.

After an attack of enteritis, the intestines are particularly liable to become much distended with flatus, giving rise to troublesome tympanitic distension of the abdomen. This state of the bowels may, in general, be corrected by external abdominal frictions, particularly with the flesh-brush, and by injections of infusion of mint, with assafetida, or turpentine. Schmidtmann recommends a decoction of the Iceland moss with colomba root, and the extract of nux-vomica, as peculiarly useful to allay the morbid sensibility of the bowels, after the inflammation has been removed.

2. *Acute Mucous Enteritis.*

Acute inflammation of the mucous membrane of the intestinal canal may attack either the whole of this structure, from the stomach to the termination of the rectum, or only a part of it; and the symptoms by which it is manifested are considerably diversified, according as its superior, middle, or inferior portions, are chiefly or exclusively affected.

* This remedy is recommended by Selle—Vide *Medicina Clinica*, p. 89. Berolini, 1785.
† On Diseases of the Stomach, &c., p. 176.

When the inflammation is seated in the *duodenum*, the tongue is generally covered with a whitish fur; the taste is bitter; the appetite greatly diminished or entirely lost; *the whole surface of the body is apt to become jaundiced;** the urine is high-colored and bilious; there is headache; and on the external region of the duodenum, a shining fullness or puffiness may generally be perceived. The pain is not often considerable, and the bowels, though slow, may be readily moved by mild laxatives or enemata. More or less nausea and vomiting usually occur; and the pulse is corded, though commonly fuller than in gastritis. (Broussais.)

When the inflammation is confined to the *small intestines*, the tongue is coated with a white or light brown fur along the middle, with its edges and tip of a bright red color; the bowels are sometimes loose, or are readily moved, the stools being of a mucous, or oleaginous character; and the "integuments of the abdomen hard and tender under pressure at particular points or patches." The stomach is generally irritable; and a continued slight burning pain, with a sensation of weight, is felt in the umbilical region, with occasional tormina.

When the inflammation is located *chiefly* in the mucous membrane of the colon and rectum, the disease is characterized by frequent mucous and bloody stools, tormina, tenesmus, and retention of the natural feces, constituting

Dysentery.

Symptoms.—This disease is often ushered in by a sense of lassitude, want of appetite, nausea, bad taste in the mouth, depressed pulse, slight chills alternating with flushes of heat, thirst, dry skin, transient pains in the bowels, costiveness, and occasionally diarrhœa. Sometimes the disease comes on suddenly with griping, mucous and bloody stools and tenesmus, without any premonitory symptoms; and this is most apt to be the case, when it arises from causes that act immediately on the mucous membrane of the intestines. In general, the fever is developed before the proper dysenteric symptoms show themselves; sometimes more or less diarrhœa, with tormina, precedes the occurrence of febrile irritation; and occasionally mucous and bloody stools, with tenesmus, are the first symptoms. From the commencement of the disease, throughout its whole course, little or no feces are discharged spontaneously—the stools consisting entirely of intestinal mucus, mixed with more or less blood. Tenesmus is one of the most constant and characteristic attendants on this affection; and the violence of this painful symptom affords us a pretty accurate measure of the violence and degree of danger of the disease. There are often considerable pain and difficulty experienced in voiding urine. The tormina are extremely violent and distressing, particularly just before the urgent calls to stool are experienced; and a constant soreness is felt in the abdomen. Sometimes the stools consist almost entirely of intestinal mucus, very little or no blood being mixed up with it. In most instances, however, a considerable portion of blood is discharged with the mucus, and in some cases the evacuations consist almost wholly of blood. These dysenteric discharges usually have a very peculiar disagreeable smell, but no fetor in the beginning of the disease; but in the advanced period of violent and dangerous cases, they frequently possess a pungent and cadaverous smell; and often acquire a corroding and sanious character. Sometimes a colliquative diarrhœa occurs a few days previous to the fatal termination of the disease. In some instances, the heart and arteries sympathize but very little with the local mucous inflammation, the febrile phenomena being scarcely perceptible; but much more commonly, the attending fever is of a high grade. In protracted and unsubdued cases,

* Dr. James Johnson, in remarking on a case reported by Andral, jun., observes: "A curious fact has in these days of diligent investigation been pretty fairly established, namely, that irritation or inflammation in the mucous membrane of the duodenum, will sometimes produce jaundice, where no obstruction can be detected in the biliary duct. This fact, we think, will ultimately throw some light on the nature of yellow fever."—*Med.-Chir. Rev.*, Jan. 1828.

great prostration ensues; the pulse becomes small, corded, and very frequent; the countenance contracted and cadaverous; the abdomen tender and elastic, and sometimes flat; the skin harsh and shrunk; the breath offensive, and the gums tender and swollen. An apparent amendment occasionally occurs after these dangerous symptoms have come on; but this truce generally lasts but a short time; for although the pulse rises and becomes better, and the tenesmus and tormina remit, the restlessness and anxiety increase; the stools become liquid, dark, pungent, and offensive; the countenance hippocratic; the extremities cold; and the surface of the body moist and clammy. At first, the tongue is covered with a white fur, becoming brown, rough, and dry along the middle in the progress of the disease, with red and moist edges. In cases of a protracted or subacute character, the edges and tip of the tongue usually become clean, smooth, and florid; and in the chronic form of the disease, the whole surface is often smooth, clean, and red; or red and granulated like raw flesh. The urine is always scanty and high-colored, and sometimes of a pungent odor.* The *hepatic* and *cutaneous* functions are always inactive in this affection, the alvine discharges being invariably free from bile, and the skin obstinately dry during the active period of the malady.

Causes.—Obstructed perspiration from cold, or vicissitude of atmospheric temperature, is a frequent cause of mucous inflammation of the intestinal canal. A cold and moist autumn succeeding a warm and dry summer, is peculiarly favorable to the production of dysentery. *Koino-miasmata* have frequently an unequivocal agency in the production of this disease. It is doubtful, however, whether paludal exhalations are of themselves capable of exciting this affection; but their influence in modifying its general character, is frequently very evident in hot and marshy countries, where the disease generally exhibits a mixed character, partaking both of the nature of bilious remitting fever and of pure dysentery. In localities of this kind, it is not uncommon to find intermitting fever and dysenteric symptoms succeed each other in alternation—several instances of which I have myself observed. Dysentery seems, indeed, very often the production of the united influence of koino-miasmata and atmospheric vicissitudes; and hence, perhaps, the almost universal presence of torpor of the hepatic and cutaneous functions in this disease.† The atmospheric temperature which is necessary to the production of miasmata, is sufficient also to excite the cutaneous exhalents to inordinate action; whilst both the heat and the miasmata tend, at the same time, to increase the biliary secretion. If, in this state of predisposition a sudden reduction in the temperature of the air occurs, or if the body be exposed to the chilling effects of a humid and cool night air, the exhalents of the surface will be rendered torpid, the blood recoil from the external to the internal vessels, and the liver, in common with the other internal organs, becoming engorged with blood, will not only become further disturbed in its functions, but contribute directly to congestion in the portal vessels, and consequently to the rise of intestinal inflammation.

There is a form of dysentery, called by some scorbutic dysentery, which appears to be the product of *idio-miasmata*, and atmospheric vicissitudes, or cold and humidity operating conjointly. Of this kind was the very peculiar and fatal

* Dr. Ferguson, in his account of the dysentery which prevailed during the British campaigns in Portugal and Spain, states, "that in the aggravated form of the disease, there appeared one never-failing symptom, which served him as a guide and diagnostic. The urine was high-colored, even green, scanty, and pungent;" and these phenomena he regarded as the signal for the vigorous employment of mercury.—*Med.-Chir. Trans*, vol. ii.

† "In every case of dysentery," says Dr. Johnson, "that has ever come within the range of my observation, two functions were invariably disordered from the very onset, and soon drew other derangements in their train. These were the functions of the skin and liver; or perspiration and biliary secretion. I defy any one, who has attentively regarded this disease at the bedside, to produce a single instance, in which these functions were carried on in a natural manner, at any period of the disease."—*On the Influence of Tropical Climates*, vol. ii.

dysentery which prevailed a few years ago at the Milbank penitentiary in England.* In this epidemic, spots or specks of a blue or livid color appeared about the hams, and sometimes over the whole surface of the inferior extremities, and occasionally also on other parts of the body. The gums were spongy, soft, livid, and much disposed to bleed; and in some, the gums ulcerated, the teeth became loose, and the mucous membrane of the lips and mouth black, while the breath was extremely offensive. Some of the patients passed pure blood from the bowels; others, a fluid like the washings of flesh; sometimes the stools consisted wholly of mucus and slime, streaked occasionally with blood; and in some instances, "they contained what seemed to be lumps of flesh." Nearly all complained of a distressing and very peculiar feeling of "sinking" at the pit of the stomach. This disease was ascribed, by the committee appointed to investigate its cause, to the constant and exclusive use of vegetable and farinaceous diet acting in conjunction with atmospheric inclemency. I think there are good grounds for believing, that in addition to these causes, an atmosphere inquinated with the effluvia generated in crowded apartments, had no inconsiderable share in the production of this very peculiar affection.

Although cold and dampness suddenly succeeding warm weather, may be regarded as a very common exciting cause of this disease, yet as great and sudden atmospheric changes frequently occur without the production of dysentery, the disease appearing extensively during some years, whilst in others it does not occur although equally variable and inclement, it would seem probable, that *cold*, or sudden variations of atmospheric temperature and humidity, must operate in conjunction with other general causes of an occult character, before the disease can become extensively prevalent.

Among the sporadic causes of dysentery, may be mentioned the immoderate use of unripe fruit; indigestible and unwholesome food; and irritating articles of all kinds received into or generated in the bowels. Most writers mention *scybala* as a frequent cause of this affection; but the correctness of this opinion has of late been, with much justice, controverted. (J. Johnson.) Out of the very considerable number of cases of this disease which have come under my own observation, I do not remember more than six or seven in which scybala were discharged. Dr. Cullen could certainly not have spoken from observation, when he declared, that "it is *certain* that hardened feces retained in the colon, are the cause of the griping, frequent stools and tenesmus."

Post-mortem appearances.—The true pathological character of dysentery was not well understood, until within the last twenty years. Richter was of opinion that dysentery is of a rheumatic or catarrhal affection of the intestinal tube. This opinion was, indeed, formerly entertained by many pathologists; it was advocated by Akenside, Stoll and Vogler. Récamier (*Rev. Médicale*, Jan. 1825) alleges that the cause of dysentery consists in a "vitiated state of the fluids which stagnate in the alimentary canal;" *i. e.*, the bile or the intestinal mucus, and the pancreatic juice. Inflammation of the mucous membrane, he says, is not primary in this affection, but secondary, the result of the irritating action of these fluids on the internal membrane of the intestines. Dr. Cullen considered the proximate cause of the disease to be "a preternatural constriction of the colon, occasioning those spasmodic efforts which are felt in severe gripings, and which efforts, propagated downwards to the rectum, occasion the frequent mucous stools and tenesmus." It does not appear that he suspected the existence of mucous inflammation as the essential pathological condition of this affection. Later inquiries have shown, however, that an inflamed state of the mucous membrane of the large intestines is invariably present to a greater or less extent in the disease.†

* An Account of the Diseases lately prevalent at the General Penitentiary. By P. M. Latham, M. D. London, 1825.

† This, indeed, is contradicted by Récamier. He states, "when death takes place early and suddenly in dysentery, whether from the disease itself, or the supervention of another malady,

In some instances, inflammation and its consequences are found nowhere but in the colon and rectum, but frequently more or less phlogosis occupies the whole extent of the intestinal tract, from the duodenum to the rectum. But even where this is the case, the signs of inflammation and its effects are almost always conspicuous in the *large intestines*. When dysentery terminates fatally, in the early or inflammatory stage, the mucous membrane of the colon and rectum presents numerous red patches, somewhat elevated above the level of the surrounding parts; and in some cases these elevated portions are covered with a number of minute vesicles—more especially "in the disease as it appears in infants."* Dr. Cheyne, in his account of dissections made at the Whiteworth Hospital, Dublin, says: "The mucous membrane of the stomach and small intestines *sometimes* presented an inflamed appearance, which in general became more remarkable as the great intestines were approached." In the colon ulceration began to show itself; in the part nearest the small intestines these ulcerations were superficial; but as the bowel was traced downwards, they became deeper and more extensive. It was remarked that the last three or four inches of the rectum were sometimes almost entirely free from ulcerations. In the cases where death took place in the early stage of the disease, from the mere violence of the fever, or from some other affection, the mucous membrane of the stomach and intestines was found more or less of a deep red or purple color, soft and pulpy, with an uneven surface, not unfrequently rough and granulated.† In some instances considerable structural derangement of the liver occurs in the affection. Dr. Preston, in his account of the dysentery which appeared in the seventy-ninth regiment at Limerick, in the year 1821, states that "the liver was invariably deeply engaged in the disease; it was in general considerably enlarged, and its whole structure apparently destroyed." That the liver is always functionally disordered in this complaint, has already been stated. In sporadic cases, however, organic derangement of the viscus is very rarely noticed, whilst in epidemic dysentery, particularly as it occurs in hot and insalubrious climates, this very frequently occurs.

Prognosis.—When the discharges in the commencement consist almost entirely of blood, the disease is usually much more tractable than when they are composed chiefly of mucus, or mucus streaked with blood. Copious discharges of blood in the beginning of the disease are beneficial, perhaps, by lessening the congestion in the portal vessels. Colliquative and fetid stools, in the advanced periods of the disease, are indicative of much danger. A tympanitic state of the bowels, more especially when attended with discharges of a "muco-sanious fluid," is a highly unfavorable sign. The appearance of bile and the natural feces in the stools, indicates a favorable change. When the tormina, tenesmus, and tenderness in the abdomen abate, at the same time that the skin becomes uniformly moist, we may regard the disease as tending towards convalescence; and the more certainly, if the stools assume more of a natural appearance.

Treatment.—There are four morbid conditions present in this disease, which point out the general indications to be pursued in its remedial management: namely, 1, inflammation of a greater or less extent of the mucous membrane of the intestinal canal; 2, general irritated vascular excitement; 3, torpor of the cutaneous exhalents; and 4, disordered functions of the liver. According to these pathological conditions, the principal indications are: 1, to moderate the febrile reaction of the heart and arteries, where it is excessive; 2, to restore the regular action of the liver and skin; and 3, to subdue the local inflammation of the bowels. In estimating the relative importance and urgency of these indications, it is to be observed, that torpor of the cutaneous exhalents, and hepatic derangement, are generally antecedent to the intestinal inflammation, as well

we find no trace of inflammation in the intestinal canal, but only acrid fluids, which are sometimes so irritating as to cause erysipelas in the parts with which they come in contact."—*Revue Médicale*, Jan. 1825, p. 23.

* Abercrombie, Pathological and Practical Researches on the Diseases of the Stomach, &c., p. 226.

† Medical Reports, &c., by J. Cheyne, M. D. Dublin Hospital Reports, vol. iii. p. 29.

as to the febrile reaction. It would seem reasonable, therefore, to conclude, that the restoration of these functions in the early or commencing stage of the disease, constitutes a primary object in the treatment of this affection, and this is indeed confirmed by experience; for in proportion as we succeed in the accomplishment of this purpose, so do we equalize the circulation, lessen the determination of the blood to the bowels, and subdue at once the general febrile excitement, and the local intestinal affection.

As high arterial excitement is incompatible with the regular performance of these functions, and tends especially to augment and sustain the local intestinal inflammation, the first step in the treatment of the disease is to moderate the febrile excitement, where it is excessive, by blood-letting. In many instances, however, the attending fever is so moderate as not to call for direct depletion; and epidemics occur in which the fever is of a *typhoid* grade, and in which the abstraction of blood is wholly inadmissible. Whenever the pulse is firm and quick, or tense and frequent, blood should be drawn. Bleeding, however, is, upon the whole, a much less useful remedy in dysentery than in many of the other phlegmasial affections. Dr. O'Brien, in his account of the dysentery in Ireland in 1821, says, "that he very much doubts if bleeding has ever succeeded by itself; or if it be capable of succeeding in this disease as it often does in other phlegmasial affections. Blood-letting ought to be considered only in the light of a useful auxiliary, and as applicable principally, if not solely, to the early stage of the disease." This corresponds with the observations of Broussais (*Phleg. Chron.*, vol. ii. p. 20); and my own experience has satisfied me of its correctness in reference to the dysenteries of temperate latitudes. In hot climates the disease is often very impetuous in its attack, and so highly inflammatory, that prompt and copious bleeding affords almost the only means for checking its violence, and preventing its rapid termination in disorganization of the liver and bowels. Dr. O'Hallaran, in the dysentery which prevailed at Gibraltar in 1824, a highly rapid and inflammatory epidemic, bled in the onset of the disease to the extent of from 30 to 64 ounces at once, so as always to induce faintness. Dr. Armstrong, too, is a strenuous advocate for decisive blood-letting in violent attacks of this disease. "Let bleeding," he says, "be once fairly introduced in the beginning of the *severer* modifications of dysentery, and there will be fewer fatal as well as chronic cases." Bleeding is, without doubt, a highly valuable remedy in the more inflammatory cases of this affection; but it is equally true that in the ordinary instances of the disease, as it prevails in the temperate latitudes, it may very frequently be properly dispensed with. When the attending fever is of a high grade, one or two efficient bleedings in the beginning of the disease, will generally moderate the tormina and fixed abdominal pain, and favor the beneficial operation of purgatives, calomel, opium and blistering; remedies upon which our principal reliance must be placed.

Purgatives, under judicious management, are among our most valuable curative means in this affection. The secretions deposited in the alimentary canal appear to be highly acrid and irritating in dysentery (Récamier), and cannot fail to increase the violence of the disease, and the sufferings of the patient, when suffered to remain in the bowels. They should, therefore, from time to time, be evacuated, by exhibiting the *milder* laxatives throughout the whole course of the disease. Formerly it was commonly supposed that purgatives proved serviceable chiefly by dislodging and evacuating *scybalæ*, to the immediate irritation of which the disease was ascribed. The most active articles of this kind were accordingly employed, and repeated often to an injurious extent. I have already stated that these hardened masses of feces are by no means very common, nor is it necessary to employ very active cathartics to remove them when they do exist in the bowels. Dr. Johnson very correctly observes, that "the search after these imaginary matters in the bowels, or rather the anxiety to dislodge them, has led to a cruel and injurious system of purgation in dysentery." Our object in the employment of aperients in this disease, is simply to evacuate the

contents of the bowels; and the less irritation that is produced in accomplishing this object the more beneficial, we may presume, will be the result. *Castor oil* and *calomel* are among our most valuable laxatives in this painful affection. As soon as can be, after the commencement of the disease, from 10 to 12 grains of calomel should be administered; and followed, after the lapse of three or four hours, by an ounce of castor oil, to which 20 or 30 drops of laudanum may be advantageously added. The union of anodyne and laxative remedies is particularly beneficial in cases attended with much pain and soreness in the abdomen. In instances of this kind the iritability of the bowels is often so great that even the mildest laxatives frequently occasion much griping and spasmodic contraction of the intestinal tube, in consequence of which little or no feculent discharges are procured by their operation. Under these circumstances, opium, so far from impeding the operation of laxatives, contributes often considerably to their aperient effects, rendering the discharges feculent, copious, and less painful. Dr. Cheyne states that castor oil did no good in the epidemic he describes, unless it was given in conjunction with laudanum, when it always answered remarkably well. Calomel should always form a part of our laxative remedies in this disease, particularly in its early stage. This article would appear to be peculiarly beneficial in the dysenteries of hot climates. Dr. Johnson (on Tropical Climates) gave it in scruple doses with the happiest effect, a practice which has been pursued in the southern districts of our own country with marked benefit. In the ordinary forms of the disease, as it occurs in the temperate and less miasmatic latitudes, however, it will seldom be necessary to resort to doses of this size, although I should apprehend no particular disadvantage from one or two such doses in the early periods of the disease. Rhubarb was at one time much employed in this affection; but its operation is always slow and uncertain in this disease, and generally attended with very severe griping. In chronic dysentery, however, rhubarb, from the tonic powers which it possesses, may be used occasionally with considerable advantage. Dr. Cheyne has known half an ounce of cremor tartar, finely levigated, and given every fourth or sixth hour, to restore patients to health, "who would, he thinks, have sunk under any of the modes of treatment in use."

Emetics were formerly much prescribed in this disease; and they deserve, in fact, much more attention in the management of this affection than they appear at present to receive. Cleghorn considered active emesis, produced by a combination of ipecacuanha and the cerated glass of antimony, as particularly useful in cases that begin like simple diarrhœa. We have also the testimony of Monro, Cullen, Pringle, Zimmerman, and Richter in favor of this class of remedies in dysentery; and among the more recent writers who speak favorably of this practice, we may mention Chisholm,* Johnson, O'Brien,† and Cheyne. I have myself had many examples of the good effects of emetics in the commencement of the disease. Pringle and Cleghorn recommend the cerated glass of antimony. The former states that he has used this remedy with success after other articles had failed. The harshness of its operation, however, has induced physicians generally to relinquish it. Chisholm thinks the sulphate of zinc preferable to any other article of this kind. Many practitioners prefer ipecacuanha, and indeed this article appears to me properly entitled to preference as an emetic in this disease. It is at once mild and certain in its operation, and generally causes a perceptible increase of cutaneous exhalation. But its peculiar advantages over other emetics in this disease arise from its tendency to allay intestinal irritation, and of increasing rather than impairing the tone of the stomach. Emetics are especially indicated when the tongue is coated with a brown fur along its middle, and where much nausea and bilious vomiting occur in the beginning of the disease. The usefulness of this class of remedies is, however, in a great measure

* A Manual of the Diseases of Tropical Climates. London, 1822.

† Observations on the Acute and Chronic Dysentery of Ireland. Dublin, 1822.

restricted to the early part of the disease. It is not probable that the beneficial effects of emetics in this affection depend merely on their evacuant operation. The concussion which the act of vomiting causes in the abdominal viscera excites the portal circulation, which is always more or less in an engorged state in dysentery; promotes the activity of the hepatic function; and finally strongly determines the circulation to the skin.

Diaphoretics.—Such is the intimate relation which subsists between the external and internal surfaces of the human body, that the inordinate excitement of the one is always attended with a diminution of action in the other; and hence, in all diseases of the intestinal canal, connected either with high irritation or inflammation, the skin is dry and harsh; and hence, too, the excitation of the cutaneous exhalents generally contributes greatly to the removal of such affections. Sudorifics have, indeed, long held a primary rank among the remedies for dysentery.* Some difference of opinion has been expressed with regard to the comparative usefulness of free sweating, and of mere gentle diaphoresis in this affection. In general, a uniform moisture of the skin will, I think, procure all the advantages which can be obtained from remedies directed to the skin. After the bowels have been adequately evacuated by mild purgatives, and the general arterial excitement moderated by venesection, where this measure is indicated by the state of the pulse, diaphoretics, in conjunction with calomel, are valuable curative means. For this purpose, the *pulvis ipecacuanhæ compositus* is probably the best article we possess. It may be given according to the following formula:

℞.—Pulv ipec. compos. grs xxiv.
Submuriatis hydrarg. grs. vi.—M. Divide into six equal parts. S. Give one every three or four hours.

A combination of opium and ipecacuanha also forms an excellent diaphoretic in this disease; from one to two grains of the latter, with one-fourth of a grain of the former may be given every two or three hours until diaphoresis occurs. Dr. O'Brien asserts, that a combination of opium, calomel, and James's powder, forms one of the most powerful anti-dysenteric remedies we possess, and Dr. Johnson concurs with him in this observation. Much benefit may likewise be obtained from a combination of from fifteen to twenty grains of the powdered root of *Asclepias tuberosa*, half a grain of ipecacuanha, and a quarter of a grain of opium, given every two or three hours. About seventeen years ago, while practising in Lancaster county, of this state, I frequently employed this combination, and the result was in general decidedly beneficial. The employment of diaphoretics should be accompanied with the free use of tepid mucilaginous diluents.

Calomel, with a view to its constitutional influence, is a remedy of excellent powers in this disease. It may be conveniently and advantageously given in union with diaphoretics. It is unnecessary to cite authorities in support of the usefulness of this remedy in dysentery. Nearly all those who have published their experience in relation to this affection concur in their statements respecting the good effects generally derived from a greater or less degree of mercurial influence in this disease. It is, indeed, seldom necessary to excite ptyalism—the slightest mercurial action being generally sufficient to obtain its curative effects in the dysenteries of the temperate latitudes. In hot and insalubrious climates the disease frequently makes its attack with great violence, and passes rapidly through its course. The liver generally suffers prominently, and often becomes disorganized in a few days. In cases of this kind the sooner the system is brought under the full influence of mercury, the greater, in general, will be the chance of the patient's recovery. (Ferguson, Johnson.)

Opium was, by the authority of Cullen, for a considerable period, almost

* Mosely asserts, that "intermittents are not cured with more certainty by the Peruvian bark than dysentery by sudorifics." This encomium, however, is *ultra rem tendere.*

wholly excluded from the list of remedies proper in dysentery. Sydenham, long before had a more correct opinion concerning the value of this narcotic in this affection. "So important," he says, "is opium in the hands of a skillful physician, that without it his hands are, as it were, tied, and his power of doing good in dysentery greatly diminished." Dr. Stokes states that cases came before him, during the epidemic dysentery in Dublin, in 1818, in which the ordinary plan of treatment by diaphoretics, purgatives, and calomel, appeared to make no impression on the disease. These cases were attended with intolerance of the slightest pressure on the abdomen, agonizing pain, unceasing tenesmus, and great pyrexia. In these instances, opium in large doses, in conjunction with copious bleeding and scruple doses of calomel, often procured decided relief. "Were the same cases again placed under my care," he says, "I would not hesitate to give opium in doses of four or five grains, as it was the opium chiefly which seemed to me to arrest the progress of the inflammation."

It should be observed, however, that though a valuable remedy in this disease, opium should not be freely given in the *beginning* of the complaint, more especially when the febrile reaction is of a vigorous grade. In such cases, decisive blood-letting should be premised. But even in cases of this general phlogistic character, *small* doses of this narcotic, in conjunction with laxatives, generally afford considerable benefit. After the disease has continued for two or three days, more frequent doses may be given in the diaphoretic combinations mentioned above. As the disease advances, opiates will become more and more necessary; and in the chronic form, or where the febrile reaction is weak, they are of primary importance. From what I have witnessed in a few cases, during the present season, I am inclined to think that the *sulphate of morphia*, dissolved in a considerable portion of some bland mucilaginous fluid, as flaxseed tea, or decoction of the slippery elm bark, constitutes a peculiarly beneficial form for administering opium in this affection. One quarter of a grain in a cup of mucilaginous liquid, may be taken every four, or six, or eight hours.

The *nitrous acid*, in conjunction with opium and camphor, is strongly recommended by Dr. Hope, of Chatham. He states that he has been in the habit of using this combination for more than twenty years, and with very marked advantage.* It may be given thus:

℞.—Acid. nitros. ʒi.
Mistur. camph. ℥viij.
Tinct. opii gtt. lxxx.—M. S. Take the fourth part of this mixture every three or four hours.

We are informed by Dr. Johnson, that the *nitrous acid* has long been used in India in this complaint, and generally with much advantage.† He has himself found it very useful in chronic bowel complaints succeeded by acute ones. In a single case of obstinate subacute dysentery, I have lately used the *pyroligneous acid* with marked success. The discharges, previous to the employment of this article, were very offensive—but in the course of twenty-four hours they were greatly improved both in appearance and smell; and the patient soon began to convalesce under the employment of this remedy, in conjunction with small doses of Dover's powder, calomel, and prepared chalk.

Sugar of lead has also been used, in union with opium, in dysenteric affections. Dr. Burk, of Dublin, gave it with very excellent effect, according to the following formula:

℞.—Acetat. plumbi grs. iv.
Tinct. opii ʒii.
Aq. destillat. ℥ii.—M. S. Take from ʒss. to ʒi. every third or fourth hour.

In this city, opium and sugar of lead have been used by a few practitioners;

* Edinburgh Medical and Surgical Journal, 1826.

† See also Observations on the Effects of Nitric Acid and Opium in the Cure of Dysentery.—*Med. and Phys. Journ.*, vol. iii.

and, as it is alleged, with considerable advantage. (Dr. Harlan.) That this astringent may sometimes prove serviceable in the advanced periods of the disease, I have myself had convincing testimony. In general, however, all astringents, of whatever kind—but certainly, more especially vegetable astringents, are improper in the early stages of this complaint, and very often wholly useless, if not injurious, even at later periods of the disease. There may occasionally be found modifications of dysentery, in which this class of remedies will do much good; and of this kind was the *scorbutic* dysentery described by Dr. Bampfield. In general, astringents appear to be much better adapted to the management of this disease, as it occurs in tropical climates—especially after the mercurial action has been gone through, and the bowels freely evacuated by laxatives. When in the advanced stage the morbid secretions continue after the inflammatory symptoms have been subdued, astringents will sometimes afford considerable advantage. Under such circumstances, we may use the decoctions of cusparia, logwood, or the root of geranium maculatum or of Heuchera Americana. Abercrombie says that he has used powdered charcoal, in combination with Dover's powder, with decided benefit, in a severe case of this disease.

The hydro-chloruret of lime also deserves attention as a remedy in this affection. According to the experience of Dr. Reed of Dublin, it is capable of procuring great benefit; and it has lately been used in Germany, as I learn by a private communication, with very decided advantage. Dr. Reed directed a solution of ten grains of this salt, in two drachms of tincture of Colomba, diluted with four ounces of water, to be taken in half ounce doses.*

The *nux vomica* was formerly much used in some parts of Europe, in the treatment of dysentery. Hagstrom, a Swedish physician, asserts that he found this article of very great service in this affection; and Hufeland states, that in an epidemic of this disease at Jena, in 1795, he obtained great benefits from this powerful narcotic. (Alibert.) From one to two and a half grains of the powdered nut should be given every two hours, after purgatives have been effectually used, and the general phlogistic excitement moderated by venesection, where it is inordinate. Schmidtmann, a German physician of great experience and celebrity, observes, that he has found this article useful in allaying the tormina, and diminishing the frequency of the evacuations; but that it appeared to him to increase the violence of the tenesmus; and the same observation has been made by other writers. Opium is a much safer and better remedy, where a narcotic may be deemed proper; and to this article, accordingly, I always give a decided preference.†

Tobacco also is ranked among the useful remedies in dysentery. Dr. O'Brien‡ employed it in the form of enemata, in the proportion of ten grains of the tobacco to six ounces of boiling water, and directed the abdomen to be fomented with an infusion of the strength of two ounces to two pounds of boiling water. When thus employed, tobacco is said to moderate the action of the heart and arteries; allay the intestinal spasm; promote free purgation; relieve the tormina and tenesmus; and restore the free action of the cutaneous exhalents.

Local bleeding by *leeches* is recommended by some, and it is most assuredly clearly indicated in this affection. It does not appear, however, from the testimony we have on this point, that the degree of advantage usually obtained from this practice, is often as great as one might reasonably expect. In infants or young children, leeching seems to be more beneficial in this disease than in adults. Nevertheless, where there is much abdominal tenderness to pressure, and the general momentum of the circulation has been moderated by venesection, great relief is sometimes obtained from thirty or forty leeches applied over the

* Med.-Chir. Rev., Jan. 1828, p. 42

† "Ab anno 1800," says Schmidtmann, "omissa nuce vomica semper unice opio usus fui, quod nunquam mea fefellit vota: fere semper adjunxi calomel."—*Sum. ma Observationum Medicarum*, tom. iii. p. 202.

‡ Loco citat.

lower part of the abdomen. Where leeches can be procured, this mode of depletion ought, certainly, not to be neglected, especially in obstinate cases, or in such as approach to a chronic character.

Blisters applied to the abdomen will sometimes do considerable good in cases attended with much tenderness and pain in the abdomen; but I have often known them applied without any perceptible advantage. From considerable experience with fomentations and large emollient poultices applied over the abdomen, I have been led to regard them of more service in this affection than vesicatories. In the dysenteries of children, particularly after leeching, I have derived much benefit from the application of an emollient poultice to the abdomen. Stimulating embrocations may prove serviceable in the *chronic* form of the disease. For this purpose, a mixture of the oil of *monarda punctata* and camphorated spirits, in the proportion of an ounce of the former to two ounces of the latter, forms an excellent article. Where there is much abdominal tenderness, a portion of laudanum may be advantageously added to this mixture. After frictions with articles of this kind, which should be repeated three or four times daily, a broad flannel roller should be tightly worn around the body in *chronic* dysentery.*

In chronic dysentery, *balsam copaiva* frequently does excellent service. Pemberton, Johnson and Cheyne speak very favorably of its use in this form of the disease. I have employed it with unequivocal benefit. It may be given thus:

℞.—Bals copaiv. ℥ss.
Pulv. g. Arab. ʒij.
Sacch. albi ʒiij.
Aq. fontanæ ℥viij.
Tinct. opii ʒi.—M. S. Take a tablespoonful every two hours.

Dr. O'Brien, who used this article with much success in chronic dysentery, states, that the best mode of correcting its disagreeable taste, is to give it in warm milk, with which it readily mixes by means of sugar. In very protracted cases, unattended with much general febrile irritation, the spirits of turpentine occasionally proves decidedly beneficial. From 10 to 20 drops, suspended in some mucilaginous fluid, should be given every three or four hours. I have, in several cases, prescribed this article with complete success. Small doses of Dover's powder, with prepared chalk, is a very useful remedy in the chronic form of the disease. From three to four grains of the former to ten or twelve of the latter may be given every three or four hours; and this combination may be beneficially employed in conjunction with the balsam copaiva. In this state of the disease, considerable benefit has been derived from infusion of some of the vegetable astringents—particularly logwood. I have used a decoction of the root of geranium maculatum in milk, with very good effect in chronic dysentery. Abercrombie recommends a strong decoction of cusparia with nitric acid and laudanum.

Dr. J. K. Mitchell has derived signal advantage from *gum water* and blue mass in chronic dysentery. Several cases yielded to these remedies, after a variety of other approved modes of treatment had been ineffectually employed.† In the thirteenth volume of the *Amer. Jour. of Med. Sciences*, Dr. J. Young has reported a case of several years standing, which, after nearly all the known remedies and modes of management for this affection had been used without permanent benefit, yielded, in a comparatively short time, under the employment of gum water, for *diet* and *drink*, together with five grains of blue mass every night, and an occasional full dose of Dover's powder. This case was under my own treatment for several months. No benefit, however, was obtained from my prescriptions.

Anodyne and emollient *enemata* are almost always highly useful in the treatment both of acute and chronic dysentery. They are particularly beneficial in

* Dewar on Dysentery.

† Amer. Journ. Med. Sciences, No. 4.

the dysenteric affections of infants and children. Infusion of flaxseed—of slippery elm—of althea—or a liquid preparation of starch, with a full dose of laudanum, should be thrown into the rectum two or three times daily. Injections of this kind, even without the anodyne, rarely fail to relieve for a time the distressing tormina and tenesmus; and they predispose the bowels to more free evacuations from the operation of purgatives. Some speak very favorably of injections of the infusion of *ipecacuanha* in this affection.

During the whole course of the disease, mucilaginous drinks—such as solution of gum Arabic, flaxseed tea, infusion of slippery elm, of althea, or very thin preparations of arrowroot, barley-water, &c., should be freely allowed. The free employment of mucilaginous fluids is of great importance in the treatment of dysentery. From the commencement to the termination of the disease, liquids of this kind should be as copiously taken as the stomach will bear. In addition to the mucilages just mentioned, we may also notice that which is obtained by decoction from the pith of sassafras. This is a very agreeable mucilage, rarely nauseating the stomach, and from information I have lately obtained, it would appear to be peculiarly beneficial in this and other forms of mucous inflammation of the bowels. In children, fluids of this kind should be repeatedly thrown into the rectum—a measure which always greatly moderates the tormenting tenesmus. Every kind of solid food must be carefully avoided. Among the foregoing mucilaginous drinks, the infusion of slippery elm bark is, perhaps, the best. Along with its abundant mucilage, it possesses slight tonic powers—a combination of virtues which renders it particularly useful in cases of a subacute or chronic character. One ounce of the bark should be infused in a pint of boiling water. Mutton suet dissolved in warm milk, is much recommended by some writers; and its effects are indeed often strikingly useful. A tablespoonful may be taken four or five times in the course of a day. Sir John Pringle speaks very favorably of yellow wax and Spanish soap melted together, as a remedy in dysentery. During convalescence from this disease, great caution should be used to avoid every kind of indigestible and irritating food. In general, some of the milder vegetable tonic astringents will contribute considerably to the speedy confirmation of health. A weak infusion of the dogwood bark, or of cusparia with nitric acid, is an excellent article for this purpose. Rice, barley, oat-meal gruel, and boiled milk, are among the most suitable articles of diet after the subsidence of the disease.

Sect. VII.—*Of Chronic Enteritis.*

Chronic inflammation of the mucous membrane of the bowels, particularly of the lower portion of the small intestines and the colon, is a much more common affection than seems to be generally supposed. Its symptoms are often so equivocal and obscure, that the disturbances which it creates in the system are frequently ascribed to anything else than to a phlogosed state of the internal surface of the intestinal tube. Most of the cases that are usually called marasmus, liver complaint, and dyspepsia, consist in *chronic* mucous inflammation of the bowels. In this variety of enteritis, little or no distinct pain is experienced in the abdomen, except when firm pressure is made on the external surface. Pain and a sense of soreness, however, are usually felt on coughing, sneezing, or any sudden motion that causes a concussion of the abdominal viscera. Connected with these symptoms, there are always considerable languor and weakness of the muscular system; the pulse is small, weak, and sharp, or corded; the hands and feet usually cold; and slight febrile exacerbations occur towards evening, attended with flushed cheeks, and a burning sensation in the palms of the hands and soles of the feet. After eating, the patient is apt to complain of more or less sharp colic pain in the bowels. Diarrhœa is, in many instances, a constant attendant; and in some cases, diarrhœa alternates with costiveness.

The appetite is often very variable and capricious—being sometimes voracious, and at others entirely gone. In the advanced period of the disease, articles of food taken into the stomach usually create much uneasiness until they are evacuated by the bowels in an imperfectly digested state. When this occurs, the patient emaciates rapidly; the abdomen in children becoming more and more tumid as the emaciation of the other parts of the body increases. The diarrhœal discharges are usually preceded by more or less tormina; and the discharges themselves vary much both in frequency and appearance. They are sometimes slimy, mixed with more or less feces, and small in quantity; purulent and bloody; or abundant and watery; occasionally dark or whitish; and pieces of undigested food often pass off with them.* The skin is generally dry, and of a sallow or dingy hue; sleep is interrupted and not refreshing; the tongue is almost always smooth and red round the margin, with a brown streak along the middle.† The temper is irritable, morose, or querulous, and a feeling of illness and suffering is depicted in the countenance. This form of mucous intestinal inflammation often continues for a long time without destroying life, but in many instances, the body emaciates rapidly, great weakness ensues, the mouth and fauces become aphthous, and the patient sinks under general hectic irritation. (Abercrombie.) Under the head of diarrhœa, this form of intestinal inflammation will be again considered; for nearly all instances of obstinate and protracted diarrhœa consist, in reality, of chronic mucous enteritis, connected, frequently, with ulcerations.

Causes.—Chronic mucous enteritis may be the consequence of the acute form of the disease. It is, however, much more frequently the result of irritation from crude and indigestible food, and other irritating substances acting directly on the internal coat of the bowels. The protracted influence of a cold and damp atmosphere, particularly when aided by unwholesome and indigestible diet, is apt to give rise to this affection. Drastic and frequently repeated purges; and, in short, everything of an irritating character admitted into the bowels, may produce it.

Post-mortem appearances.—The appearances on dissection are very various in this as in the other varieties of gastro-intestinal inflammation. Sometimes we find a number of red patches, with fungoid elevations in a greater or less extent of the mucous membrane; and ulcerations of different shapes and sizes almost always occur in some parts of this structure. Sometimes "there are extensive tracts of ragged ulceration alternating with fungous elevations." We sometimes find the internal surface of the colon, or the lower portion of the ileum, covered with ulcerated and indurated elevations; and frequently the area of a considerable portion of intestine is contracted, so as scarcely to admit a large-sized bougie. It is now well ascertained, that ulcers of the mucous membrane of the bowels frequently cicatrize; and that such cases are not, therefore, to be regarded as altogether insusceptible of cure. Dr. Latham,‡ in his account of the diseases of Milbank, relates examples of this kind; and the observations of Petit, (of the Hotel Dieu,) Andral, jun., and M. Billard, have furnished us with ample and interesting evidence of the cicatrization and cure of such ulcerations. M. Troillet has also related instances in which this important process was fully de-

* Abercrombie states, "when the disease extends along the whole course of the colon, the feces generally come off in a liquid state, and in this case we may have the evacuations consisting sometimes of thin healthy feces, more or less combined with the morbid discharge; and, at other times, we may find the morbid discharge coming off without any appearance of feculent matter. When the disease is in the *small* intestines, we seldom see the peculiar discharge uncombined. It seems either to be small in quantity, or to come off so mixed with feces as not to be easily distinguished."

† Broussais, *Phleg. Chron.*, vol. i.

‡ Dr. Latham, in his account of the Milbank epidemic, says: "there was, however, one appearance not unfrequently met with in our examinations, with which I was not then acquainted. This was the appearance of ulcers in the mucous membrane of the intestines, in the course of their progress toward reparation."—*An Account of the Disease lately prevalent at the General Penitentiary.* By P. Mare Latham, M. D., London, 1825, 8vo. p. 286.

monstrated. (*Jour. Gén. Méd. and Med.-Chir. Rev.*, July 1826, *et passim.*) M. Troillet, in giving an account of the dissection of a subject that had died of enteric inflammation, says: "The ulcerations were of an oval and round form, varying in diameter from six to ten lines, with fringed edges, and surrounded with a brownish circle, beyond which the mucous membrane was sound. They occupied the lower portion of the ileum. Their surfaces presented the following marks of incipient, advanced, and complete cicatrization. Those in the first state were covered with a fine pellicle, transparent even after being washed or scraped with the scalpel. It was in some degree movable on the subjacent cellular substance. In other ulcerations, where the work of regeneration was more advanced, the pellicle was thicker, slightly opaque in some parts of its surface, and amalgamated, as it were, with the fringed edges of the sore. In those ulcers where the cicatrization was nearly completed, the pellicle had acquired the thickness, the consistence, and the aspect of the common mucous membrane. In those parts where the healing process had advanced to the greatest degree, the fringed condition of the edges had entirely disappeared; the surrounding circle was of a faint color, or in some places annihilated, and the mucous membrane was completely regenerated."

Treatment.—Proper dietetic regulations are indispensable, and constitute, indeed, our most valuable means for combating this affection. The diet must be of the mildest kind, "and such as leaves the least feculence to pass along the intestines." Liquid *farinaceous* articles, such as preparations of arrowroot, oatmeal, barley, tapioca, rice and sago, constitute the best nourishment in this affection. Boiled milk, rye-meal mush, boiled rice with sugar, and occasionally a poached egg, may also be used. Animal food, in a *solid* form, is inadmissible. These observances are indispensable to the successful treatment of this malady. No treatment, however judicious in other respects it may be, can avail, if the patient do not rigidly and perseveringly abstain from all kinds of solid or irritating aliment. Having given directions for the regulation of the diet, a mild laxative should be prescribed; and for this purpose, *castor oil* is perhaps the best article we possess. Broussais rejects, unreservedly, all kinds of laxatives in this as well as in other varieties of enteritis. It can hardly be doubted, however, that the vitiated secretions, and acrid results of decomposition in the bowels, will be much more apt to make injurious impressions on the phlogosed mucous membrane, when suffered to accumulate, than the occasional transient stimulus of castor oil, with eight or ten drops of laudanum. My own experience at least has led me to this conclusion, although I am strongly impressed with the conviction, that active purgatives, and even laxatives, when *frequently* given, are decidedly injurious.

Leeches applied to the abdomen are among our most efficient means for subduing the intestinal phlogosis. They should be applied, from time to time, to an extent corresponding with the patient's strength, and activity of the pulse. Much advantage may also be obtained from the application of blisters to the abdomen; and, in a few instances, I have known decided benefit to be derived from pustulation with frictions of tartar emetic ointment. Wearing a flannel bandaged tightly round the body, sometimes proves serviceable, particularly after leeching, or rubefacient frictions to the belly.

Among the internal remedies most useful in this affection, are small doses of Dover's powder, with or without minute portions of calomel;* *balsam copaiva* in the form of an emulsion; and *spirits of turpentine.*†

* ℞.—Pulv. ipecac. compos grs. xxxii.
Calomel gr. i.—M. Divide into eight equal parts. S. Take one every five or six hours.

† ℞.—Spir. tereb. ℥ss.
Vitel. ovi.
Sacch. albi ℥ss.
Aq. fontanæ ℥iij.
Tinct. opii ℥iss.—M. S. Take a teaspoonful three or four times daily.

It may appear inconsistent to recommend *balsam copaiva* and *spirits of turpentine* in this affection, after having declared that the most unirritating diet is a *sine qua non* in this treatment, and that *active* cathartics are injurious, on account of the irritation they produce in the phlogosed structure.

Whatever may be the conclusions of *reason* on this subject, *experience*, which is always our best instructor, teaches that both the articles in question are often decidedly beneficial in the present variety of intestinal phlogosis. There is nothing more extraordinary in this than in what is observed in the treatment of some other varieties of inflammation. In *catarrhal ophthalmia*, soothing applications are undoubtedly proper; yet the application of a weak solution of lunar caustic, or of small portions of precipitate ointment, will very frequently produce an immediate amendment in the disease, whilst astringent washes seldom fail to do mischief. And we may, moreover, observe, that we apply turpentine to the inflamed skin from burns or scalds, and with great, and often immediate relief. There is a power in some articles, besides their general stimulant effects, to produce a *peculiar* excitement, which, in certain states of inflammation, is particularly salutary; and this appears to be the case with the articles just mentioned in the present disease. These remedies should, however, be given in small doses; and they generally procure most advantage when administered in conjunction with mucilage, and small doses of opium or of extract of hyoscyamus. Dr. Grenville speaks very favorably of the employment of sulphate of copper in affections of this kind; and Dr. Abercrombie observes, that he has found this article highly useful in this disease. The dose, at first, is half a grain, combined with an equal quantity of opium, and gradually increased, if necessary, to the extent sometimes of three grains, with half a grain of opium, three times daily. Dr. Elliotson also has published cases illustrative of the good effects of this remedy in chronic inflammation of the mucous membrane of the bowels. "I had two very severe cases," he says, "in which the quantity of blood and matter evacuated, and the wretched appearance of the countenance, rendered the existence of great disease of the inner surface of the intestines probable, and which would most likely have proved fatal but for this remedy. Both these men recovered, after having taken the medicine about six months." These patients took the sulphate of copper with opium, in doses of three grains, three times daily.*

Much benefit may be obtained in this form of enteric inflammation, from the use of the *persesquinitrate of iron*. From fifteen to twenty drops of it may be administered twice daily, in a small portion of gum water.† The sulphate of iron, also, in doses of from a half to two grains, twice or thrice daily, is much recommended by Abercrombie in this affection. In some instances a decided advantage has been obtained from the use of nitrate of silver; I have prescribed this article in union with the extract of hyoscyamus with marked benefit. Half a grain of the nitrate, with a grain of the extract, may be given three times daily. Abercrombie mentions borax as a useful remedy in this affection.

I have employed a decoction of the slippery elm bark, in conjunction with occasional leeching, and the use of small doses of balsam copaiva, with the happiest effects in several instances of this disease.

Sect. VIII.—*Of Acute Peritonitis.*

Acute inflammation of the peritoneum is frequently ushered in by a feeling of lassitude, pain in the limbs, and slight creeping chills, alternating with flushes of heat. Headache, and a sense of weight or uneasiness in the epigastrium, are

* Med.-Chirurg. Transactions.

† The mode of preparing the persesquinitrate of iron is given in this work, in the chapter on diarrhœa.

equally among the first symptoms. Acute pain is often felt in some part of the abdomen, at the very commencement of the disease. Occasionally, however, the pain does not occur until the febrile reaction is established, and in some instances it comes on suddenly, with much violence, during or immediately after the first sensation of chilliness. The abdominal pain is frequently, for a time, confined to a small space, but it generally soon spreads throughout the whole or a greater part of the abdominal cavity. Pain does not, however, always occur in this affection. In some instances of the most aggravated character, little or no pain, but only slight uneasiness, is felt in the abdomen. (Andral.) Sometimes the abdominal pain "moves irregularly about, remaining for a few hours in one spot, and suddenly removing to another." *In all instances, pressure on the external surface of the abdomen is extremely painful.* To avoid this source of suffering, the patient lies on his back, with the knees and shoulders raised, in order to take off the tension of the abdominal muscles, and the pressure of the bed-coverings.* The bowels are constipated, or moved with considerable difficulty;† the pulse is frequent, more or less tense, contracted and sharp, and occasionally, though rarely, it is round and full. The tongue is moist, and at first covered with a thin white fur, the edges and raphe becoming sometimes red in the progress of the malady. In some instances, the stomach sympathizes strongly with the abdominal affection, the patient being harassed with nausea and vomiting in the early stage of the disease. The face is usually pale, exhibiting a peculiar sharpness of feature, and an expression of great anxiety. Constant wakefulness is very commonly present throughout the whole course of the disease, but delirium rarely occurs except towards the conclusion of fatal cases. Generally, in the course of from twenty-four to thirty-six hours, the abdomen becomes tumid, tense and elastic, from flatulent distension of the intestines, and extremely tender. Respiration is oppressed and laborious in the latter period of the disease; *inspiration*, especially, being short, difficult, and attended with an expression of pain in the countenance. The secretion of urine is almost invariably more or less diminished, and in some instances almost wholly suppressed. When the peritoneal coat of the bladder is the seat of inflammation, "the evacuation of the urine will almost uniformly be suspended," and much pain felt in the pelvis. The peritoneal covering of the inferior surface of the diaphragm is occasionally the principal or sole part of this membrane which is inflamed, and in this case almost constant hiccough attends. (Scoutteten.)‡ When peritonitis occurs in the puerperal state—constituting what is usually termed puerperal fever, the lochia almost always cease to flow; and the secretion of milk becomes arrested or greatly diminished. In cases of this kind, the general powers of the system usually sink much earlier than in cases occurring in males, or in females not in the puerperal condition.

Acute peritoneal inflammation is generally very rapid in its progress. It seldom continues beyond the sixth or seventh day without terminating either in resolution or in death, or passing into the chronic or subacute state. It often terminates fatally as early as the third day; and Andral asserts that its progress is occasionally so rapid, "that only a few hours intervene between the origin of the inflammation and death." But when the inflammation assumes the *subacute* grade, it is frequently prolonged to the thirtieth or fortieth day before it proves fatal. Acute peritonitis is not particularly prone to terminate in gangrene.§

* "In milk fever the abdomen is soft and not painful on pressure, the rigors are slight, and the pulse seldom exceeds ninety. The countenance is natural, the breasts are swelled, hot and tender, and all these symptoms disappear in 24 or 36 hours."—*Ryan's Manual of Midwifery.*

† "Constipation," says Dr. Johnson, "is as general a concomitant of peritoneal inflammation, as dysenteric purging is of inflammation of the mucous membrane of the intestines."—*Med.-Chir. Rev.*, Sept. 1820, p. 167.

‡ Med.-Chir. Rev., June, 1824, p. 199. See also, *Archives Générales*, &c., for December and February, 1824.

§ Abercrombie. *On the Diseases of the Stomach*, p. 169.

When this occurs, the abdominal pain suddenly subsides; the pulse becomes very small, frequent, and often intermitting; great muscular prostration ensues; the extremities become cold and clammy; and the countenance pale, hollow and contracted. Slight wandering delirium usually occurs at last, in cases that terminate in this way.

Causes.—Acute peritonitis may be produced by mechanical injuries of the abdominal viscera; violent and long-continued corporeal exertions; stricture of the colon and rectum; perforation of the stomach or bowels by slow ulceration, and the consequent passage of the ingesta or feces into the cavity of the abdomen; extravasation of blood, urine, or bile, into the peritoneal cavity; the action of cold on the surface of the body, causing sudden suppression of the perspiration; wet and cold feet; drinking cold water while the body is in a free state of perspiration; *parturition;* sudden suppression of the hemorrhoidal discharge, or of the menses; metastasis of erysipelas (Abercrombie); and of *rheumatism;** and it would appear a peculiar *contagion*, to which females are liable soon after parturition.

Post-mortem appearances.—Pathological investigations have now fully established the fact that the peritoneum may be violently inflamed without the inflammation extending to the subjacent structures. That portion of this membrane which covers the stomach, intestines and other viscera, has often been found strongly inflamed, and even gangrenous, while the other structures of these organs were perfectly sound. (Broussais, Abercrombie, Armstrong.) In some cases the peritoneum exhibits large patches of a deep purple, and occasionally even of a black color. Strong adhesions between the intestines very frequently occur; and in some instances there is more or less adhesion formed between the intestines and the inner surface of the abdominal cavity. Scoutteten found, in several instances, subperitoneal emphysema. Sometimes these adhesions are formed without the intervention of false membrane, (Scoutteten,) but much more frequently pseudo-membranous layers form the bond of union.† White membraniform concretions are generally found also on different parts of the peritoneal surface of the stomach, liver and bowels. Effusion into the abdominal cavity, of a whitish fluid containing small flocculi of lymph, or of a reddish or yellowish fluid, almost always occurs. *Blood* has been found effused into the abdo-

* Andral. jun., has related a case of peritonitis which manifestly arose from translated *rheumatism.* (Repert. Générale, &c., No. 4.) Dr. James Johnson, in reference to this case, observes: "We think the most skeptical pathologist will hardly deny that there was in this case, a transference of inflammation from the joints to the peritoneum." This patient was received into *La Charité* whilst laboring under acute rheumatism. *Several venesections* were practised. After some days the rheumatism suddenly ceased, and acute pains soon came on in the abdomen. The abdominal pain speedily acquired great violence, and death took place on the third day from the disappearance of the rheumatism in the joints. On dissection, strong and extensive signs of inflammation were detected in the peritoneum.

† [In the No. of the Med.-Chir. Review for Oct. 1844, a new term is given for a disease, (perityphlitis,) which recalls to my mind several cases of peritoneal tumors which I have seen resulting from acute inflammation. In the case of a young man whom I attended in 1820 with the late Dr. Physick, an attack of acute peritonitis terminated in the formation of a firm tumor in the right iliac region, and a circumscribed abscess of the inferior portion of the peritoneal cavity. This was followed by an irremediable obstruction. On a post-mortem examination a date-stone was detected in the appendix vermiformis, which gave origin to the inflammation of the appendix, and a prodigious effusion of coagulating lymph around it. The purulent effusion which followed traveled downwards to the cavity of the pelvis. The late Dr. Riter, of this city, was afflicted with a large and very tender tumor in the same region, which followed a circumscribed inflammation of the peritoneum, and gave him intense trouble at every return of irritation, for many years, until it finally destroyed him. In a similar case from Pike county, and in the person of a son of Mr. Hanly, the druggist, in Lombard street, the same kind of tumors were dispersed, after the subsidence of peritonitis, by a gentle ptyalism, reapeated leechings and counter-irritation. I have lately seen two such cases, which terminated in abscesses of the right iliac regions, discharging liquid feces. In another case, which I attended with Dr. Samuel Tucker, the abscess was opened posteriorly above the crest of the ileum, from which a long lumbricoid worm eventually came out.—Mc.]

men in acute peritonitis. In some cases the fluid is thick, and of a straw color, "resembling diluted pus, with a very peculiar odor;" and in other instances, a soft, white, sebaceous matter, resembling soft butter, is found deposited in the interstices formed by the convolutions of the intestines. Andral found a number of small tubercles between the peritoneal and mucous membranes of the bowels, some of which were softened down, and had burst through the peritoneum. In nearly all instances, a greater or less extent of the peritoneum is found strongly injected.*

The occurrence of effusion, or suppuration into the abdominal cavity, is generally announced by a diminution of the pain and tenderness of the abdomen, attended with a sense of weight and oppression in the hypogastric region; rigors; coldness of the extremities; a soft and feeble pulse, and sometimes slight diarrhœa.

Treatment.—The first and most important remedial measure in the treatment of acute peritonitis, is *blood-letting*. There is no inflammatory affection, in which prompt and decisive bleeding is more essential to success in its treatment, than the present one. No definite directions can be given as to the quantity of blood which it may be necessary to draw. The first bleeding ought to be carried to the extent of making a very obvious impression on the system; and it should be repeated as soon as the pain and febrile reaction rise again, if the first do not break up the violence of the disease. I have opened a vein three times in as many hours, before a permanent impression was made on the disease. The period during which blood-letting may be employed with a prospect of advantage in this disease, is in general limited to the first twenty-four hours from its commencement; and in many instances, a lapse of twelve hours will render this powerful remedy abortive, or even detrimental. When blood is promptly and very efficiently abstracted, soon after the inflammation is developed, the disease is often prostrated at once, so as to yield, without much difficulty, to other suitable measures.

After the violence of the local and general symptoms has been in some degree subdued by venesection, topical bleeding from the abdomen with leeches, will in general contribute considerably to the further reduction of the peritoneal inflammation. The abstraction of blood by leeches is generally much more beneficial in peritonitis than in any other variety of abdominal inflammation, and should, indeed, always be resorted to, whenever leeches can be procured. After leeching has been employed, it will be useful to apply a large emollient poultice over the abdomen, which will keep up a moderate discharge of blood, for some time, from the leech-bites; and by its relaxing effect tend to promote the cutaneous exhalation from the external abdominal surface. Instead of a poultice, cloths wrung out of hot water may be kept applied to the abdomen with advantage.

As soon as the abdominal pain and tenderness are somewhat moderated by the means just mentioned, a stimulating purgative should be administered, in a dose sufficiently large to excite active purging. The employment of active cathartics in this disease deserves to be regarded as a highly important measure. In no case can they be omitted without losing the benefit of a valuable remedy. In nearly all instances of peritoneal inflammation, there is considerable difficulty in moving the bowels; and it generally requires strong doses of the most active articles of this kind to procure free evacuations. The advantages which purgatives afford in this disease, are usually proportionate to the activity of their operation. This does not accord, however, with the observations of Broussais, who affirms that active purging is hurtful in peritonitis, on account of the vermi-

* Dr. Lee "has most satisfactorily proved, that all the destructive febrile affections which follow parturition are invariably associated with, if not directly caused by, inflammation of some of the textures of the womb or of its appendages; and that the type or character of the fever is probably dependent upon the particular tissue most involved; thus, that in inflammatory pyrexia the peritoneal lining is inflamed, in the congestive the muscular substance, and in the low typhoid, the veins of the uterus and ovaria."—*Med.-Chir. Rev.*, 1833, p. 59.

cular contractions which it excites in the intestines, and its consequent increase of the morbid sensibility of the peritoneum. Dr. Abercrombie also regards active purgation as seldom necessary, and often detrimental in this disease. Independently, however, of the many authorities of the first respectability, that might be cited in favor of the use of active purgatives in this malady, I have too often had the most unequivocal evidence, in my own practice, of the decided usefulness of purging in peritoneal inflammation, to admit, in my mind, of any doubt concerning the efficacy of this practice. Upon this point, Dr. Johnson makes the following judicious remarks: "In abdominal inflammation, provided the mucous tissues are not inflamed, purgatives excite the secreting vessels, not only of the whole internal surface of the intestines themselves, but of the glandular organs whose secretory ducts open into the primæ viæ, and thus powerfully deplete locally the vascular system of the abdominal viscera. When the portion of the peritoneum reflected over the intestines is inflamed, but where the villous coat is unaffected, I hesitate not to assert from personal experience, that constipation of the bowels will, in nine cases out of ten, be a feature of the disease; and in such cases I maintain, that to excite the natural action of the mucous membrane, immediately after proper vascular depletion, is a very powerful means of checking the peritoneal inflammation; in the same way that a free expectoration from the mucous membrane of the bronchia relieves the vascular turgescence and inflammation of the parenchymatous structure, or pleural covering of the lungs."* By stimulating the mucous membrane with purgatives, we not only deplete the abdominal vessels generally, but also strongly determine the circulation from the peritoneal capillaries to those of the former membrane.

Of all our purgatives, *castor oil* in union with *spirits of turpentine* has appeared to me the most valuable in the present affection. I have, in a considerable number of instances of puerperal peritonitis, derived signal advantage from this remedy.† I have usually prescribed it according to this formula:

℞.—Ol. ricini ℥ii.
Spir. terebinth. ʒvi.—M. S. Take the half at once, and the remainder in two hours, if purging has not commenced.

It is not always necessary, however, to resort to the use of this active purgative at once. In some instances, a full dose of calomel and jalap, or of infusion of senna, or of castor oil, will procure adequate discharges; but where these articles fail to produce the desired effect, the turpentine and castor oil in union,

* Med.-Chir. Rev., September, 1820.

† In one remarkable case of peritonitis, I endeavored to procure purging by means of calomel and jalap, and infusion of senna, without success for a whole day. The disease had acquired so great a violence that I had nearly lost all hopes of the patient's recovery. Finally, I ordered a mixture of two ounces of castor oil with six drachms of spirits of turpentine, and directed the patient to take a tablespoonful every half hour. After the fourth dose, purging began, and brought off an enormous quantity of dark-colored and extremely offensive fecal matter. The patient was greatly relieved by this evacuation, and could bear considerable abdominal pressure, which before was insupportable;—in short, all the symptoms were strikingly mitigated. Convalescence soon ensued under the use of purgatives, and a large blister to the abdomen.

Dr. Hamilton administered turpentine in a few cases, but without success. Blundell and Copeland also tried it, but without any marked benefit. The profession in Dublin also have ceased to employ it. All, however, who have used this remedy, assert that it does no injury. —*Med.-Chir. Rev.*, 1832, p. 120.

Dr. Dewees has recorded a case of puerperal fever which was regarded hopeless, after the antiphlogistic treatment had been fully employed. A last recourse was had to 30 drops of turpentine every hour, the application of sinapisms to the legs and an ounce of mercurial ointment rubbed on the abdomen every night, with an enema containing one drachm of laudanum. This practice was continued for three successive days, and the patient recovered.—*Amer Journ. Med. Sciences*, Aug. 1828.

Dr. Isaac A. Johnson has published six cases, in each of which he exhibited half an ounce of turpentine with the same quantity of castor oil every hour until the bowels were freely purged, and then the medicine was continued at longer intervals. All these cases terminated favorably. —*Amer. Jour. Med. Sciences.*

will usually bring on copious purging. I have used, with much advantage, a mixture of cremor tartar and powdered jalap in this affection. This will seldom fail to produce very abundant watery discharges from the bowels. There are few articles which excite so copious a discharge from the intestinal exhalents as cremor tartar; and when given in union with jalap, its operation is generally prompt and active. From twelve to fifteen grains of the jalap to forty grains of cremor tartar, may be given every hour until the bowels are freely moved. Dr. Pring strongly recommends the use of calomel in puerperal peritonitis, in ten grain doses, every six or eight hours. "Copious stools," he says, "quickly followed a sudden salivation, and a favorable convalescence was afterwards maintained by purgatives of the weaker sort."

The application of a *blister* to the abdomen will often do considerable good, where, after decisive blood-letting and purging, some tenderness on pressure remains on the inflamed parts. Leeching, if practicable, should, however, always be premised to vesication; but neither of these local means can be resorted to with a prospect of much benefit, until the acute character of the disease has been subdued by prompt and copious general depletion. The blistered surface should be dressed with some application capable of keeping up a free discharge; and for this purpose, the *mercurial ointment* is, perhaps, the most useful in the affection. Mercurial frictions have, indeed, of late, been particularly recommended in the treatment of this disease. M. Velpeau has reported four cases (*Rev. Médicale*, Jan. 1837), in which two drachms of mercurial ointment, applied by frictions to the abdomen every two hours until the mouth became sore, appeared to do much good. M. Laennec also cured several cases of *subacute* peritonitis by mercurial frictions. As soon as the mouth became sore, the symptoms began to decline. (*Rev. Médicale*, Mai, 1824.) I have met with one case in which the supervention of the mercurial action appeared to exert a strong influence in arresting the further progress of the disease. This was a very acute case. Copious venesection was practiced, and large doses of calomel administered with castor oil as purgatives; on the third day, the mouth was found to be sore and the breath fetid; convalescence speedily ensued.

Among the internal remedies beneficial in this disease, *opium* with *calomel* deserves to be particularly mentioned. After the violence of the local and general symptoms has been broken down by energetic venesection, leeching and purging, we may, in general, resort to this combination with great advantage. I can speak with much confidence of the usefulness of this remedy, having, for the last ten years, employed it in this disease with unequivocal benefit in a considerable number of instances. In *puerperal* peritonitis especially, opium either alone or in combination with calomel, is often peculiarly serviceable. "In puerperal fever," says Dr. Armstrong, "in which the peritoneum chiefly sustains the intensity of the inflammation, *opium* may be given with considerable advantage, particularly when the local pain and constitutional irritation are excessive; though in that stage of excitement, it must not for a moment be forgotten, that bleeding and purging are the principal measures. When the stage of collapse approaches, opium may, perhaps, be accounted the primary measure, since the allaying of irritation is then the principal object. Whenever opium is administered in any species of abdominal inflammation, the *dose should be large;* for a small dose often stimulates, whereas a large one is a direct sedative." This narcotic may be very usefully administered in this affection at the same time that cathartics are employed: for opium in large doses, whilst it allays the pain and general irritation, often manifestly promotes the operation of purgatives in peritoneal inflammation. I have usually prescribed this article in combination with calomel, in the proportion of two grains of the former to three of the latter every three or four hours.

Antimony and nitre are seldom admissible in this disease, on account of the great gastric irritability which usually prevails. Digitalis has been recommended as a useful article in this affection. When the pulse remains irritated and sharp,

after the disease has been in a great degree subdued, digitalis in small, but frequent doses, may be advantageously used. One grain should be given every two or three hours, until the frequency and tension of the pulse are sufficiently moderated. Most practitioners employ this remedy in much larger doses than the one just mentioned; but I have generally found the action of the pulse more speedily moderated when given frequently and in small portions, than in larger ones at longer intervals.

When a state of collapse ensues after the inflammation has been overcome by the means already mentioned—an event which occasionally occurs in puerperal peritonitis—it must be counteracted by the employment of stimulants. Wine, the carbonate of ammonia, opium and camphor, and Dover's powder with quinine, are the best articles for this purpose. "There is a period in some cases of abdominal inflammation where the disease is just subdued, but where there is a kind of balance between recovery and gangrene. The pain will vanish; the pulse become weak; the vital powers appear to sink, and a coldness overspread the body. The symptoms are too often indicative of mortification; but every experienced practitioner must have occasionally witnessed cases of recovery even from this alarming state. Here we must give wine; for, if gangrene *have* commenced, no harm can ensue from the remedy; and if it have *not* commenced, the wine may happen to give a salutary stimulus to the nervous and vascular systems, when stagnation of the vital fluids is on the point of taking place, and where further evacuations would be instant death." (Johnson.)

The nourishment throughout the whole course of the disease should be of the mildest and weakest kind. A little thin barley or rice-water may serve at once for food and drink. The greatest care must also be taken to guard the patient against taking cold during the period of convalescence; as a renewal of the disease, in a subacute form, is extremely apt to occur from this and other exciting causes.

Sect. IX.—*Of Chronic Peritonitis.*

The approach of *chronic* inflammation of the peritoneum, when not the sequel of the acute form of the disease, is so gradual and insidious, that it seldom becomes the object of medical attention until incurable structural changes have taken place, or effusion into the cavity of the abdomen. It is only by attending to the passage of the acute into the chronic form, that we are enabled to give an account of the early symptoms of the latter. When the peritoneum becomes affected with the chronic inflammation, more or less uneasiness and tenderness are experienced in the abdomen, and when pressure is made externally, or the patient coughs, sneezes, or performs any sudden motion by which a concussion of the body is produced, a feeling of soreness is felt about the umbilical region. In many instances, there is slight pain in some part of the abdomen, which may be either continuous or occasional. In no instance, however, is the abdominal pain severe, for serous membranes, in a state of chronic inflammation, never give rise to acute pain; and many cases are recorded in which this structure was found completely disorganized from chronic inflammation, without the patient having complained of any pain whatever. The abdomen generally becomes fuller, and in some instances elastic, or more or less tympanitic. Frequently, a sense of tightness and pricking soreness is felt across the lower part of the abdomen, after fatigue from bodily exertion. "There is no tension of the skin of the abdomen as in the acute species; on the contrary, the skin and abdominal muscles often sit loosely upon the peritoneum, which gives a sensation to the touch, as of a tight bandage underneath, over which the skin and muscles may be felt, as it were, to slide. The patient always complains more of tightness than of pain; and as the tightness is much increased by any congestion in the bowels, the relief

which he experiences from evacuating their contents leads him to attribute his sensations to an habitual costiveness."*

On feeling the external surface of the abdomen, we sometimes find deep-seated spots of induration which are more or less tender to the touch. (Abercrombie.) In some instances, the patient experiences a sensation as if a ball were rolling about the abdomen. Broussais ascribes this sensation to the adhesion between the different convolutions of the intestines into a round and movable mass. Such adhesions between the coils of the intestines may be suspected, says Armstrong, "by a lobulated or irregular feel of the bowels under the hand when passed over the abdominal integuments." The bowels in this affection are generally torpid. The pulse is often not perceptibly affected; except in the advanced periods of the disease, and towards evening in the early stage, when it usually becomes jerky or somewhat accelerated, quick, and contracted. The appetite is generally sufficiently strong, nor is the function of digestion particularly disordered, but in some instances vomiting occasionally occurs. The face and whole surface of the body are generally pale, with an expression of ill health and languor in the countenance. Slight febrile exacerbations towards evening, with more or less oppressed respiration and cough when the patient lies horizontally on the back, and the appearance of œdema of the feet with paucity of urine, are pretty certain indications that effusion is taking place in the abdomen. The affection is not unfrequently connected with disease of the lungs.

Chronic peritoneal inflammation varies greatly with regard to its duration. It sometimes terminates in fatal disorganization and effusion within a few months; and cases occur which continue in a very slow and insidious way for many months, and even for several years, before the system is worn down by the general irritation it ultimately causes. Whether protracted or short in its course, this affection of the peritoneum always terminates in more or less effusion, or suppurative secretion in the cavity of the abdomen. In truth, ascites is, in the majority of cases, dependent on a low degree of inflammatory irritation of the peritoneum.

Causes.—*Chronic* is frequently a sequel to *acute* peritonitis. It sometimes occurs as the consequence of acute mucous inflammation of the intestinal canal—the inflammation passing from the former membrane to the peritoneal covering of the bowels. This is, indeed, no uncommon occurrence. I have met with two instances of subacute peritonitis, which came on in consequence of dysentery; and one other remarkable case which supervened on acute mucous inflammation of the bowels, brought on by irritating ingesta. Dr. Hodge of this city has given an account of a well-marked case of this kind, which was evidently produced by dysenteric inflammation.† Long-continued torpor and congestion of the portal system from hepatic torpor or protracted constipation, are probably sometimes the cause of this affection. It may also be the consequence of acute or chronic inflammation of the solid viscera of the abdomen—particularly of the spleen and liver. Blows or injuries inflicted on the abdomen; difficult parturition; suppression of perspiration, and of hemorrhoidal discharge; metastasis of erysipelas; cold, &c., will sometimes give rise to this affection.

Post-mortem appearances.—More or less fluid is invariably found effused into the cavity of the abdomen in those who die of this affection. This fluid is commonly of a whitish or whey-like color; sometimes it is limpid and yellow; and occasionally it is found of a reddish appearance, with small flocculi of false membranes floating in it. Occasionally, though rarely, the extravasated fluid is mixed with a considerable portion of blood; and instances occur in which it appears to consist of pure blood. (Scoutteten.) I have met with a case of this latter kind. The intestines are often glued together in different parts by the intervention of false membranous matter; sometimes sacs are formed by these

* Pemberton on the Viscera.

† American Journal of Medical Sciences, &c., April, 1829.

membraniform exudations, and the intestines, containing purulent matter or other fluids of various appearances. Occasionally the intestines are found agglutinated into one mass, "and partly covered with thickened and adherent omentum." (Broussais.)

Thickening of the peritoneum is a very common post-mortem phenomenon in this affection. In some instances, this membrane, though thickened and otherwise disorganized, is but little injected or red; in other cases, it is found reddish and highly injected. Very frequently the surface of the peritoneum is covered with innumerable small white granulations of a *tubercular* character.* Bayle states, that in a subject he examined, where these tubercular depositions were very abundant, he could easily scrape them off with a scalpel; and where this was done, the peritoneum underneath appeared perfectly sound. In some instances, the peritoneum is considerably thickened by granular depositions between its two layers. (Gasc,† Broussais, Abercrombie,‡ Pemberton.) The mesenteric glands are usually enlarged and indurated.

Treatment.—Chronic peritonitis might, perhaps, be generally removed, if it could be subjected to remedial treatment during its incipient or early period. Such, however, are the obscurity and uncertainty of its early phenomena, that it rarely becomes an object of medical attention until it has proceeded to an extent which renders the most judicious treatment almost invariably abortive. Broussais, indeed, for a considerable time regarded this affection as wholly beyond the reach of remedial management. Subsequent experience, however, convinced him that if proper remedies are applied during the first twenty or thirty days of the disease, it may sometimes be effectually subdued, and he thinks it possible that it may yield even at a much later period of its course. This writer accounts for the great difficulty of curing this form of peritoneal inflammation, by referring it to the impossibility of producing the absorption of the tubercular matter which is so constantly deposited between the layers of the peritoneum, and which, therefore, keeps up a continued irritation in this membrane. External irritating and depleting applications to the abdomen, constitute our most efficient means for combating this affection. *Leeching* is decidedly indicated, and often, no doubt, contributes considerably to the removal of the disease, where disorganization or effusion has not yet occurred. After local depletion, a large blister should be applied over the abdomen, and kept discharging by dressing it with mercurial ointment. From several instances which have lately come under my notice, I am inclined to regard pustulation, by means of tartar emetic ointment, more efficacious than blistering. We may also use stimulating frictions, followed by emollient applications to the abdomen, with a prospect of advantage; more especially where the general system is in too irritable a state to admit the more irritating applications just mentioned. The application of *moxa* to the abdomen has never, I believe, been recommended in the treatment of this affection. From its known powerful influence in subduing deep-seated inflammations, it is not improbable that considerable and prompt benefit might be derived from this application in the present affection. The warm bath has also been recommended as a useful auxiliary in the treatment of this disease. Within the last few years, frictions with mercurial ointment have been used with success in this affection, by Velpeau and Laennec; and from the accounts which they have published, this remedy would seem to be entitled to very great consideration. The latter writer has reported seven cases of *chronic* and *subacute* peritonitis which yielded to mercurial frictions. Two drachms of the ointment should be rubbed in every

* "It is always difficult, and frequently impossible," says Dr. Armstrong, "to predict that tubercles exist on the serous membrane of the abdomen. But when the skin assumes a delicate hue—when the conjunctiva is blanched—when the expression of the face is more softened and pensive than natural, and especially when the patient has any cough, a presumption of their existence might be excited."

† Dictionnaire des Sciences Médicales, vol. xl.

‡ Edinburgh Medical and Surgical Journal, No. lxiii.

two hours, until the gums become slightly affected. Since the publication of the first edition of this work, I have witnessed the good effects of this practice in a well-marked case of this variety of peritonitis. The disease had continued several months before I prescribed for the patient. The abdomen was enlarged, very tense, and extremely tender to the touch. A course of mercurial frictions over the abdomen, together with one of the following pills* at night, had the effect of gradually subduing the disease, and restoring the patient's health. *Diuretics* also are strongly recommended in the treatment of this disease, but they can be regarded only as auxiliary to the more direct and efficient applications already mentioned. Broussais advises the use of diuretic articles in the way of frictions on the abdomen. The tincture of cantharides, or of squills, may answer for this purpose. If any advantage is to be derived from this class of remedies, however, it will probably be better to exhibit them by the mouth, whilst other more efficacious applications are made to the abdomen. Dr. James Johnson recommends the following combination as a particularly powerful and useful diuretic, in the present, as well as in other affections:

℞.—Acidi tartarici ℈i.
Sodæ carboni grs. xxiv.
Infus. digitalis fl. ℥ss.
Spir. ætheris nitrici fl. ℥i.
Tinct. scillæ ♏iv.
Aq. menthæ ℥ij.—M. ft. This dose to be taken twice or thrice daily.

Mild laxatives must from time to time be used, so as to obviate costiveness and consequent irritation from this source. Castor oil, or the acetate of potash, and cremor tartar, will commonly answer well for this purpose. Although *active* purgatives are not among the means generally recommended in this disease, I have in a few instances known decided benefit to result from the employment of the following mixture:

℞.—Crem. tartar ℥iss.
Pulv. scillæ ℥i.
Pulv. sulphat. potass. ℥ij.
Tart. antimonii grs. ij.—M. ft. S. Take ℥ss. three or four times daily.

This combination produces copious watery discharges from the bowels, and stimulates the kidneys to increased action.

To allay the general irritation which is apt to occur in this disease, we may give small doses of Dover's powder, or full doses of extract of hyoscyamus, or of conium maculatum. From the diaphoretic tendency of the first of these articles, it deserves, I think, a preference in this affection. It is of great importance in the management of this disease, to restrict the patient to the weakest and mildest articles of nourishment. Dr. Johnson observes, in reference to the possibility of procuring the absorption of the tubercular matter deposited in the peritoneum in this disease: "There can be little doubt that the absorbents might be made to act upon many extraneous and morbid growths in the human body, by *rigid abstinence* alone, if patients had fortitude to persevere in the measure. For our own part, we should place more confidence in this than in any other remedy; and practitioners should at all times bear in mind, that without strict abstemiousness there is little hope of a cure in chronic peritonitis."—(*Med.-Chir. Rev.*, Sept. 1820.) May we not expect some advantage from *iodine*, in the form of frictions on the abdomen, in this affection? It appears to me worthy of trial.

* ℞.—Massæ. hydrarg. grs. xxx.
G. aloes grs. x.
Tart. antimonii gr. i.—M. Divide into ten pills.

Sect. X.—*Of Acute Hepatitis.*

Although not a very frequent disease in the temperate and colder latitudes, *hepatitis* is one of the most common maladies engendered by the influence of an intertropical or hot climate. The acute form of this disease often makes its attack suddenly, and with great vehemence, particularly in those parts where it prevails endemically, as along the sandy coast of Coromandel and the marshy districts of Bengal. When the invasion occurs thus suddenly and violently, the patient is seized, without scarcely any previous symptoms of indisposition, with pain in the right hypochondrium, accompanied with a sensation of tightness across the abdomen, difficult respiration, and an inability to continue in the recumbent position, the patient feeling easiest when in a sitting posture with the body inclined forwards. This mode of attack is frequently observed in the intertropical regions. In the temperate latitudes it usually comes on in a more gradual and less impetuous manner. The patient complains of a feeling of tightness in the right hypochondrium and epigastric region, with slight incipient febrile symptoms, for a considerable time before the true character of the disease becomes obvious. The pain attending acute inflammation of the liver is apt to extend itself from parts remote from this organ, more especially to the breast and to the *clavicle* and *shoulder of the right, and sometimes the left side.* In some instances these sympathetic pains are even more severe than those experienced in the liver itself. Mr. Annesley observes that when the internal structure of the liver is the seat of the inflammation, the pain is generally heavy and aching; but when the surfaces or the ligaments become affected, it is usually acute, tensive, and pungent. Pressure on the right hypochondrium always greatly aggravates the pain in that part, and a similar effect is almost invariably produced by an attempt to lie on the *left* side; although in some instances the reverse obtains, the patient feeling *most ease* when recumbent on the left side. A dry and troublesome cough, with more or less difficulty of breathing, are common attendants on this disease. When these symptoms are connected with pain in the thorax, the disease may be readily mistaken for pneumonia. Nausea and bilious vomiting frequently occur in acute hepatitis, and, in general, the severer these symptoms are, the less cough and difficulty of respiration will be experienced by the patient. In many instances there is a distressing "feeling of anxiety at the epigastrium and præcordia, accompanied with frequent deep sighing, particularly when pressure is made simultaneously on the right hypochondrium and under the right shoulder-blade." A more or less jaundiced hue of the white of the eyes and skin about the breast, face, and neck, is one of the most constant phenomena of this disease. (Louis.)* The urine, also, is invariably highly imbued with bile, exhibiting a deep yellowish-brown color.

The thirst is usually very urgent, and the skin hot and dry. The pulse is generally full, active and firm; but in some instances it is small, tense and quick: and this is said to be the case when the concave surface of the liver is the seat of the inflammation, and the peritoneal surface of the stomach or colon participates in the inflammation. The tongue is coated with a white or thick yellowish fur, and the taste is often bitter; or, "it is smooth and glossy, marked by fissures, and lobulated." (Annesley.)

In general, the bowels are costive; yet, in hot climates, diarrhœa often attends from the beginning of the malady. (Chisholm.) Cases of this kind generally commence like dysentery. The patient is seized with violent griping, followed soon by small watery or slimy discharges from the bowels, accompanied with

* Mr. Annesley states, that jaundice is not a frequent concomitant of hepatitis in India, unless the ducts or gall-bladder become involved in the disease, or when it supervenes upon biliary calculi or other obstructions of the ducts.

soreness at the pit of the stomach, or of the right side. If pressure is made on the right hypochondrium, the patient shrinks from the touch; yet the pain in this part is seldom violent. "The degree of violence of the bowel affection," says Dr. Johnson, "will very generally indicate the degree of rapidity and danger of the hepatic inflammation. A scalding sensation in making urine almost always occurs; and the brain often sympathizes strongly with the liver in this affection, giving rise to more or less mental disturbance."

Acute hepatitis rarely continues beyond the sixth or seventh day, without tending either to resolution or suppuration. When the latter has taken place, the pain becomes moderated; the patient experiences a sense of weight and throbbing in the region of the liver, with irregular rigors; more or less profuse night sweats; a sense of sinking, with anxiety and oppression in the præcordia; a clammy skin; and a sense of formication. In some cases, "nearly the whole of the right lobe becomes one enormous abscess." Sometimes adhesions take place between the parts surrounding the hepatic abscess and the internal surface of the abdomen; and when this occurs, and the abscess points outwards, the pus may be discharged by puncture or incision, and the patient often cured. When the abscess is about pointing externally, the general fullness, distension and pain in the region of the liver and epigastrium, which occur before the suppurative process commences, are at first somewhat increased; but as the suppuration goes on, and the matter proceeds outwardly, a soft and more or less circumscribed tumor makes its appearance, whilst the general fullness and tenderness in the right hypochondrium, in a great measure subside. "When the abscess advances beneath the false ribs, or near the epigastric region, it is generally sufficiently perceptible; but when it points higher up, or more posteriorly, so as to come beneath the ribs, then the bulging out of the hypochondrium is merely marked with fullness of the intercostal spaces, and pain and soreness limited almost entirely to one spot. In a great majority of hepatic abscesses, the direction is to the exterior and superior surface of the liver, and hence the communication so frequent with the diaphragm and lungs when they fail in pointing more externally." (Annesley.) Sometimes the liver forms adhesions with the colon, or some other portion of the intestinal canal, and the abscess bursting into it, the pus is discharged by stool. Dr. Saunders thinks it probable, that the matter formed in the substance of the liver, may sometimes pass into the bowels through the biliary ducts. When adhesions form between the liver and diaphragm, the abscess may burst into the cavity of the thorax, or into the pulmonary cells, in which latter case it is often brought up copiously by expectoration. Dr. Wilson* observes, that there is perhaps no instance of recovery after this accident; an observation, however, which has been abundantly contradicted by the experience of others. I have seen an instance in which an enormous quantity of thin reddish pus was discharged from an hepatic abscess through the lungs, followed by a perfect recovery of the patient's health. Annesley mentions cases of this kind;† and Schmidtmann‡ relates two instances of a similar character and successful termination.§ Purulent expectoration sometimes attends hepatitis, from the inflammation extending to the mucous membrane of the bronchial tubes, or to the substance of the lungs, without any direct communication between the abscess in the liver and the cavity of the thorax. Cases occur, in which the hepatic abscess bursts in the cavity of the abdomen; these are almost necessarily fatal. It has been doubted whether an abscess containing *laudable* pus can be formed in the parenchymatous structure of the liver. Louis states, that by far the greater

* On Febrile Diseases. † Loco citat.

‡ Summa Observationum Medicarum, vol. ii.

§ Louis asserts, that abscesses in the liver are incurable: for in all his examinations he never found a single instance of cicatrization in the liver. Dr. Johnson remarks, upon this assertion, "that those who have practiced in India know that abscesses of the liver will heal occasionally, whether they are opened externally, or make their way into the intestines."—*Med.-Chir. Rev.*, January, 1827.

number of abscesses which occur in the proper substance of the liver, do not contain genuine pus, but a fluid less homogeneous, containing small flakes of blood of a darkish gray color, or like the washings of flesh. In 430 dissections, he found but *five* instances of *purulent* abscess in the substance of the liver, and not one in its coverings. When genuine pus is formed in hepatitis, the abscess probably occurs in the cellular membrane, between the peritoneal covering and the glandular structure of the liver.*

Gangrene also, though very rarely, occurs in hepatic inflammation. (Bichat.) Annesley, however, seems to doubt whether this mode of termination ever takes place in hepatitis. He states that he never met with an instance of this kind, although his opportunities for observation were very ample.

In some instances, the disease terminates in a softening of the structure of the liver. Annesley sometimes found the surface of this viscus "marked with red, brown, brick-colored, greenish-brown, and even with almost black spots and streaks, while the internal structure was inflamed, congested with blood, much tumefied, and softer than natural." Abercrombie found the parenchyma of the liver soft, broken down, and nearly of a black color.†

It is supposed by Dr. Saunders,‡ that in the acute variety of this disease, the capillaries of the hepatic artery are exclusively implicated in the inflammation; and that in the chronic form the inflammation exists in the extreme branches of the vena portæ. The same opinion is expressed by Professor Puchelt;§ and Winslow ascribes both varieties to an inflamed state of the vena portæ. There is certainly no good reason why the capillaries of the vena portæ may not become the seat of inflammation; and when we take into consideration the peculiarity of the hepatic circulation, the opinion of Dr. Saunders is not without considerable plausibility.

Diagnosis.—Pain in the right clavicle and shoulder has generally been regarded as one of the most characteristic phenomena of hepatitis. This symptom, however, is much less common than is generally supposed. M. Louis‖ doubts whether it is really indicative of hepatic inflammation, and thinks it arises usually from some affection of the lungs or pleura. Upon this subject Mr. Annesley observes: "The pain sometimes complained of at the top of the right shoulder, and so improperly stated as being one of the chief signs of hepatitis, is, when present, certainly characteristic of the disease in the *right* lobe; but unfortunately this symptom is only occasionally present; and the inexperienced practitioner, who has been taught to look to this as a distinctive mark of the disease, infers, when it is not observed, that the liver is sound."¶

Hepatitis may be distinguished from pneumonic inflammation, by the following diagnostic circumstances. In *pleuritis*, the cough and oppression in the chest are much severer than in *hepatitis*. In the latter affection, the patient rests easiest when lying on the affected side; in the former, the reverse obtains. In hepatitis, pressure on the right hypochondrium greatly aggravates the pain, whilst pressure on the intercostal spaces produces little or no increase of suffering; in pleuritis, the former does not, but the latter does increase the pain. When the *substance* of the lungs is inflamed, the difficulty of breathing and the pain are aggravated by lying on the sound side, as in hepatitis; but in the former affection, respiration is performed chiefly by the action of the abdominal muscles and the diaphragm; whereas, in the latter, (hepatitis,) breathing is effected almost entirely by the action of the intercostal muscles—the chest being sensibly dilated and collapsed by the act of respiration, whilst the abdominal muscles are quies-

* Memoir on Abscesses of the Liver. By M. Louis.—*Repertoire Méd.*, No. ii., 1826.
† Pathological and Practical Researches, &c. &c. Edinburgh, 1828.
‡ On the Liver.
§ Ueber das Venen System. &c. Leipsic, 1815.
‖ Repertoire Méd., No. ii. 1826.
¶ Researches into the Causes, Nature and Treatment of the Diseases of India, &c. By James Annesley, Esq.

cent. The pneumonic symptoms are always most conspicuous when the convex surface of the liver is inflamed.

The diagnosis between hepatitis and inflammation of the stomach is rarely attended with any difficulty. The latter affection is almost invariably attended with a very contracted and weak pulse, whilst in the former it is generally moderately full and hard. In gastritis, great muscular prostration usually attends from the commencement of the disease, and everything taken into the stomach is commonly almost immediately rejected; in hepatitis, the strength is at first not much impaired, and although frequent vomiting may occur, it is not so readily excited by ingesta as in gastritis. In the former, pressure on the right hypochondrium—in the latter, pressure of the epigastric region, causes most pain. From the pain produced by the passage of biliary concretions through the gall-ducts, or by spasm of these passages, hepatitis is distinguished by the absence of fever in the former, the pulse rarely rising above 90 beats in a minute, and the heat of the skin being but little or not at all raised above the healthy standard. In spasm, or irritation by biliary concretions of the gall-ducts, the pain often intermits for a time; in hepatitis, it is continuous. In the former affection, the easiest posture is when the body is bent forward on the pelvis; in hepatitis, the patient leans a little to the right side, with the knees slightly drawn up. When the inflammation is confined to the peritoneal covering of the liver, there are always more pain and fever than when the glandular structure of this organ is the seat of the disease. (Abercrombie.)

Causes.—Dr. Saunders and others describe the frequent occurrence of hepatitis in hot climates, to the prevalence of a peculiar miasm in these regions. There can, indeed, exist but little doubt, that koinomiasmata often contribute materially to the production of this disease; but their agency is probably rather predisposing than exciting, in relation to this affection. Miasmata unquestionably possess an especial power to derange the biliary functions; and it may be reasonably presumed, that where, from the general prevalence of this cause, in conjunction with high atmospheric heat, the liver is in an habitual state of morbid excitation or functional derangement; every adventitious exciting cause—such as the sudden influence of a cool and damp night air; errors in diet, and consequent gastric derangement; the intemperate use of spirituous liquors, &c., would be peculiarly apt to develop inflammation in the biliary organs. Dr. James Johnson has advanced some novel and very plausible sentiments in relation to the etiology of this disease. He observes, that "between the extreme vessels of the vena portarum in the liver, and those on the surface of the body—in other words, between the biliary secretion and the perspiration, there exists one of the strongest sympathies in the human frame; and that, whatever increases or decreases the action of the cutaneous exhalents, increases or decreases also the secretion of bile in the liver. Knowing, therefore, as we do, how uniformly high atmospheric temperature excites excessive perspiration, we cannot be at a loss to account for the frequency of hepatitis in hot climates. The excessive and continued perspiration occasions a loss of tone in the extreme vessels of the surface; and this loss of tone in the capillaries of the skin, is accompanied by a corresponding loss of tone in the secretory vessels of the liver. As, however, the perspiratory vessels, from their excessive and long-continued action, become debilitated and extremely sensible to the slightest degree of cold, so when the temperature of the atmosphere is suddenly reduced, as is generally the case in hot climates during the night, when the dew falls, the extreme vessels of the surface are instantly struck torpid, which, in consequence of the sympathy just mentioned, is immediately followed by a similar torpor of the secretory vessels of the liver. The perspiration and biliary secretion being, therefore, thus simultaneously arrested, and the passage of the blood through the liver obstructed, a commotion is raised, which, as there already exists a congestion in the portal circle, falls mainly upon that system, and gives rise to inflammation." That there exists a strong sympathy between the liver and the skin, is strikingly

illustrated by the fact, that in chronic hepatic inflammation, or in torpor, or scirrhus of this organ, the skin is always dry and harsh—it being nearly impossible in these affections to excite a perceptible general exhalation from the surface.

It appears to me, nevertheless, that the influence of malaria is too much overlooked in this sympathetic doctrine. High and continued atmospheric heat is so universally attended with the extrication of miasmata, that it would seem extremely difficult to say how much of the previous hepatic excitation, and consequent atony, is to be ascribed to the one or the other of these causes. That a very considerable share of the effect in question is to be placed to the account of malaria, seems to be demonstrated by the fact, that bilious and hepatic affections are far from being common on board of ships cruising in tropical seas, and where the materials for miasmatic exhalations are absent; although the influence of atmospheric heat is constant and great.

Besides the exciting causes just mentioned, there are many others of a less general character, capable of giving rise to this affection. Violent and fatiguing exercise; contusions of the right hypochondrium; metastasis of gout* and rheumatism; wounds and injuries of the cranium;† atmospheric vicissitudes; a draught of cold water while the body is in a state of free perspiration; irritation from biliary concretions in the gall-ducts; suppression of hæmorrhoids; violent rage; terror;‡ and mental despondency,§ &c., may all give rise to acute inflammation of the liver. Hepatitis may be excited in children by the irritation of dentition.‖

Treatment.—In this disease, as in other inflammatory affections, the abstraction of blood is a primary remedy. There are two reasons for resorting to decisive blood-letting in the commencement of this affection—namely, the necessity of promptly lessening the general momentum of the circulation, as well as the congestion in the liver and portal vessels; and the importance of subduing the general phlogistic condition as early as practicable, in order to favor the effects of mercurial remedies, upon the prompt influence of which much of our reliance must be placed. (Johnson.) As soon as blood has been drawn to an extent sufficient to make a manifest impression on the system, an active mercurial cathartic must be administered. From fifteen to twenty grains of calomel, followed in about two hours by a full dose of castor oil, or of infusion of senna and manna, constitute an appropriate and efficient purgative in this disease. It is often necessary to repeat the bleeding several times in the course of the first few days, before the arterial reaction becomes permanently moderated; and this is particularly apt to be the case in the disease as it occurs in temperate latitudes. In warm climates, a frequent repetition of venesection is not often necessary or even proper—one or two efficient bleedings in the commencement of the disease being in general sufficient to bring down the febrile reaction.

The application of leeches to the epigastric and hypochondriac regions, will often contribute very materially to the reduction of the hepatic inflammation; but one or two efficient bleedings from the arm should be premised to the local abstraction of blood. It may be necessary to reapply the leeches where, after

* Quantis implicetur, says Schmidtmann, periculis hepatitis ex podagra retropulsa subnata lugubri illustris Augusti Gottl. Richter, præceptoris mei summe colendi interitu probatur; qui quippe ex podagra hepar petente et inflammante, annum agens septuagesimum, post paucos ab invasione dies occubuit.—*Observ. Medicar.*, tom. ii. p. 231.

† Louis doubts this:—The rise, however, of hepatic inflammation and abscesses from this cause is well established by the testimony of many observers. See the Memoirs of M. Bertrandi and M. Andouillé, in the Mémoires de l'Acad. Roy. de Chirurg., tom. iii. p. 439.

‡ Schmidtmann mentions an instance of hepatitis caused by terror: "Jam memoravi me deprehendisse, hepatitidem terrore esse excitatem."—*Summa Obs. Med*, vol. ii p. 197. Hippocrates speaks of terror as an exciting cause of this affection: De internis adfectionibus. Sect. iii. cap. i.

§ A very striking and interesting case of this kind is related in the Annuaire Medico-Chirurgicale for 1822.

‖ Hufeland's Journal der Pract. Heilkunde, vol. xviii. p. 62.

the adoption of the measures just indicated, the pulse still retains some activity and the local symptoms are not considerably relieved.

The bowels should be kept in a loose state throughout the whole course of the disease; and *calomel* must always constitute a principal ingredient in the purgatives employed. From eight to twelve grains of this preparation may be given at first, every six hours, and followed by the exhibition of a small dose of Epsom or Glauber's salts; or of castor oil, or infusion of senna and manna, if after ten or twelve hours the calomel do not procure free evacuations. After the general arterial reaction has been moderated by direct and local depletion, and the bowels well evacuated, our principal dependence should be placed on the speedy induction of modern ptyalism, in conjunction with blisters applied over the region of the liver and moderate purgation. The practice of giving *opium* with calomel in this affection, particularly after the violence of the phlogistic excitement has been broken down by venesection, was long ago recommended as decidedly beneficial by Dr. Robert Hamilton; and it has since his time received the warm sanction of many of the most eminent practitioners. "I know from pretty ample experience," says Dr. Johnson, "that in conjunction with antimonial powder, opium forms a most admirable auxiliary to mercury in acute hepatitis; not only soothing many uneasy sensations of the patient, but determining to the surface and promoting a diaphoresis, which is of infinite service in this as in most other affections."* Dr. Armstrong also expresses his confidence in the usefulness of this narcotic in hepatitis; and in my own practice I have had unequivocal evidence of its beneficial effects in this malady. From three to four grains of calomel, with a grain of opium, may be given every four or five hours, and continued until the gums are obviously affected. The addition of two or three grains of the *pulvis antimonialis* to each dose of the calomel and opium, will do good not only by its diaphoretic powers, but also, as it would seem, by its tendency to favor the induction of the *mercurial* influence; and our main object must be to bring the system under this influence as early as possible.

Whilst these articles are given, it will generally be necessary to exhibit an occasional dose of castor oil, or one of the saline purgatives. In the more violent and rapid cases of this disease in hot climates, it is often very difficult to obtain the timely operation of mercury on the system merely from its internal exhibition. When there is reason to apprehend difficulty in this respect, mercurial frictions should be used in addition to the internal employment of calomel. One or two drachms of the ung. hydrarg. may be rubbed in on the arms or thighs three or four times daily, where ptyalism appears to be tardy in its appearance. Dr. Johnson states, "that the absorption of mercury into the system, and the consequent early induction of general mercurial action, are accelerated by causing the patient to swallow a considerable quantity of warm diluting drink, as thin water gruel, every night at bedtime."

The application of blisters large enough to extend over the whole right hypochondriac and epigastric regions, is a highly useful measure, after bleeding has been efficiently practised. They almost always give considerable relief to the local pain, and by creating a permanent determination to the external surface immediately over the inflamed liver, they tend in no small degree to subdue the local affection.

As auxiliaries to bleeding, purgatives, and calomel, *antimonials* will, in general, be useful where the stomach is not too irritable. The *pulvis antimonialis*, in doses of about three grains, may be given either in combination with calomel and opium, or in union with nitre, or the sulphate of potash, every three or four hours; and to promote the diaphoretic operation of these remedies, as well as the specific effects of the mercury, the warm or tepid bath will frequently be found very useful.

* The Influence of Tropical Climates, &c., vol. i.

When the inflammation has terminated in suppuration (an event which is announced by the occurrence of rigors, a sense of sinking and anxiety in the præcordia, night-sweats, and occasionally formication of the skin, with a fullness and feeling of weight about the margin of the ribs, and a dull throbbing pain in the liver), the further employment of mercury, with a view to its general influence, is improper. "If the local symptoms and the state of the pulse and of the system seem to require it, the application of a few leeches in the vicinity of the tumefaction will be generally serviceable; and afterwards poultices should be assiduously employed with a view of promoting the external pointing of the abscess." (Annesley.) The bowels also should be regularly though gently evacuated, after the formation of abscess has taken place, which may be best done by five or six grains of calomel, followed in a few hours by a small portion of one of the neutral purgative salts. When the abscess does not point externally, nothing more can be done than "to palliate symptoms as they rise, and wait for the event." In instances where the abscess does point outwardly, and the fluctuation of the matter can be distinctly felt, an opening should be made into it, and exit given to its contents. "But this operation ought not, however, to be undertaken precipitately, and before the purulent formation has made its way sufficiently near to the external surface of the organ, or before the part at which it points has formed adhesions to the opposite part of the abdominal parietes. The practitioner should also be fully convinced, from the state of the tumor in the hepatic region, and from the history of the case, that abscess actually exists, and that the tumor does not proceed from an excessive accumulation of bile in the gall-bladder. When the pain and general fullness are diminished, and replaced by a distinct tumor, without acute pain, soft and fluctuating at its apex, or with a soft elasticity and slight lividity or redness of the surface, and a somewhat hardened and elevated base, the operation may be undertaken with every expectation of success."

The operation of paracentesis thoracis has been successfully performed in cases where the abscess had burst into the cavity of the thorax. An interesting case of this kind is related by Mr. Huggins, in the *London Med. Repos.* for July, 1827.

After suppuration has taken place, and the matter found a favorable exit, there is, perhaps, no remedy which will afford so much advantage as the nitro-muriatic acid. It may be employed both internally and externally as a foot-bath, in the manner recommended by Dr. Scott. Equal parts of the nitric and muriatic acids are the proportion in which they are usually employed. From a half to a whole drachm of this mixture, diluted in a sufficient quantity of water, may be taken daily; and in order to prevent the acid from coming in contact with and injuring the teeth, it should be sucked through a small glass tube, or a quill; or the feet and legs may be immersed from thirty to forty minutes every evening in a warm bath, of the strength, at first, of half an ounce of the acid mixture to a gallon of water, and afterwards gradually increased in strength to the amount of six or eight drachms to the gallon. In two instances of hepatic suppuration from acute inflammation, the patients recovered completely under the protracted use of this bath. Considerable advantage may also be obtained, in suppuration of the liver, from small doses of the muriate of mercury in union with the extract of cicuta, in the proportion of one-tenth of a grain of the former, to two grains of the latter, three times daily. Mr. Annesley has derived advantage from the nitric acid in combination with laudanum, hyoscyamus, or conium, particularly when the abscess has opened into the lungs. When in cases of this kind, the system becomes much exhausted, and the night-sweats are copious, or where the digestive powers fail, recourse ought to be had to some of the tonic bitters, in conjunction with nitric acid and the extract of conium.

Sect. XI.—*Chronic Hepatitis.*

Chronic inflammation of the liver, when not the consequence of an acute attack of the disease, begins, generally, with symptoms of functional disorder of the digestive and biliary organs; and dyspepsia frequently seems to be the only affection present. The patient complains of irregular appetite, and impaired powers of digestion; acidity; flatulence; slight colic pains; occasional nausea and vomiting; and a sense of fullness in the region of the stomach. In many instances, a slight dull pain and weight are felt in the right hypochondrium, accompanied, in some cases, with a dragging pain in the right shoulder. Most commonly, however, no distinct pain is experienced in the region of the liver, except when firm pressure is made on this part. In such instances, a sense of uneasiness and tightness is usually felt in the right hypochondrium; and if examination be made, a manifest tumefaction is often discovered in this part. The white of the eyes, and skin of the face, neck and breast, become tinged with a yellowish hue, and the countenance acquires a contracted and sickly aspect. The bowels are always very irregular, costiveness being most common, alternating, in some instances, with diarrhœa, the discharges being frequent, scanty, dark-colored, offensive, slimy, greenish, or watery and muddy. The urine is generally highly tinged with bilious matter, and creates a sense of scalding in the neck of the bladder on being voided.* The tongue is for the most part white, and rather dry; the taste bitter or disagreeable: and in the advanced periods of the disease, the gums often have a peculiar and unnatural firmness. One of the most constant and characteristic symptoms of chronic hepatitis, *is a dry, harsh, and constricted state of the skin.* (Johnson.) So torpid are the cutaneous exhalents in this affection, that every effort to produce a general moisture, or even softness of the skin, is generally abortive. A short dry cough, with slight difficulty in breathing, is a frequent attendant on this disease. In the chronic, as in the acute form of this disease, the patient can seldom rest as easy on the left as on the right side. As the disease advances, emaciation becomes more and more conspicuous; slight febrile exacerbations come on towards evening, attended with a burning heat in the palms of the hands and soles of the feet; the nights are restless; and when the inflammation terminates in suppuration, hectic and rapid emaciation consume the vital powers.

When the *convex* surface of the liver is the principal seat of the inflammation, the pain will be referred to the thorax; but when the *concave* surface is the part chiefly affected, the patient generally refers the pain to the stomach or bowels.

Chronic inflammation of the liver often occurs as a consequence of the acute variety of the disease; but it more frequently arises from the slow operation of the same causes which excite acute hepatitis. From the great frequency of chronic affections of the liver in warm and miasmatic situations, there can exist but little doubt, that the slow and continued operation of marsh miasmata is a principal cause of this affection. That this miasm has a particular tendency to produce biliary derangement, seems evident from the sallow and jaundiced appearance of those who reside in marshy districts. The liver being in a state of almost constant excitation in situations of this kind, and finally disordered in its functions, is especially predisposed to congestion and slow inflammation, on the supervention of any other cause capable of deranging the cutaneous or digestive functions.

Post-mortem appearances.—Chronic inflammation may terminate variously. No recent traces of inflammation are detected in the liver on post-mortem examination. The viscus usually exhibits an ash or clay color, and is generally

* Mr. Rose and Dr. Henry assert, that urea and lithic acid are not found in the urine of persons laboring under hepatitis.

somewhat changed from its healthy, or natural shape. Dr. Saunders observes, that the lower margin of the left lobe, which in the healthy liver is thin, is commonly found rounded and gibbous in chronic hepatitis. In some instances the liver is of a much more firm and solid consistence than natural, although its weight is often specifically lighter than the healthy organ. In some cases, particularly in hot climates, the liver suffers much greater organic destruction than mere change of consistence and color. Dr. Lind found the liver, in persons who had died of this disease, so eaten through as to resemble a honeycomb. Suppuration is a common termination of chronic hepatic inflammation in India. "Not unfrequently, very minute abscesses are scattered through the substance of the liver, both with and without the appearance of a distinct cyst, the matter collected being of a firm or cheesy consistence, and yellowish-white color. (Annesley.) Sometimes, however, one large abscess is found in the structure of the liver. Tubercles of various sizes and appearances, are occasionally found imbedded on the surface, and interspersed through the substance of the liver. These morbid depositions vary in consistence "from a gristly or cartilaginous state, to one of semi-fluidity;" the firmer ones when divided often presenting either a concentric or radiated texture. In the most chronic cases, the substance of the liver sometimes acquires almost a cartilaginous consistence. Annesley states, that in those who had been addicted to the use of spirituous liquors, the substance of the liver besides small tubercles, exhibited "a cheesy consistence and texture of a deep nankeen-like color." Occasionally the liver is firm, and much diminished in size, and its internal structure has sometimes exhibited a par-boiled, scabrous, dry and spongy appearance.*

Treatment.—General depletion is very rarely indicated in this variety of hepatic inflammation. In cases of a subacute character, more especially when they occur as a consequence of an acute attack of the disease, it will sometimes be useful to abstract small portions of blood; but even in instances of this kind it will be better to deplete by *leeches* applied to the epigastrium. "In the chronic hepatitis of India," says Annesley, "there are few cases where repeated though moderate leeching will not be advantageous." After each leeching, an emollient poultice should be applied over the right hypochondrium, and a mercurial aperient administered at night. When the phlogistic action of the liver has been reduced, (where such reduction may be indicated by the local pain, and action of the heart and arteries,) by moderate depletory and aperient measures, recourse should be had to a more regular administration of mercurial remedies. In the employment of mercury in this affection, however, it must be managed so as not to produce active ptyalism. Full salivation seldom proves beneficial, and may do injury in this form of the disease. A moderate, uniform and prolonged mercurial influence will generally procure all the advantage that this remedy is capable of affording. From three to four grains of blue pill, in combination with a grain of the extract of conium, or of hyoscyamus, should be given three times daily, until the gums become slightly affected.† The medicine is then to be discontinued until the soreness of the gums is going off, when it is to be resumed, and given once or twice daily, so as to keep up a uniform impression on the system without producing ptyalism. During this mercurial course, mild laxatives should from time to time be given, so as to keep up a regular action of the bowels. For this purpose, small doses of Glauber's or Epsom salts, or of powdered rhubarb, may

* Researches into the Causes and Treatment of the Diseases of Warm Climates. By James Annesley, Esq., p. 470.

† I have been in the habit of uniting small portions of ipecacuanha to the blue pill and conium in this and other chronic complaints. Thus:

℞.—Massæ hydrarg ʒi.
Extract. conii maculat. ʒss.
Pulv ipecac. ϑi.—M. Divide into thirty pills. S. Take two every morning, noon and evening.

be given every second or third day, according to the state of the bowels. Mr. Annesley recommends the following aperient pill in this affection:

℞.—Hydr. submuriatis ℈i.
Extract. colocynth. comp. ℈ij.
Antim. tart. gr. i.
Pulv. ipecac. grs. iv.
Sapon. Castil. grs. x.
Ol. carui q. s.—M. ft. pilul. xviij. S. Two of these pills may be taken every night on going to bed. In most cases one pill will be sufficient.

To preserve the tone of the stomach, as well as the regular action of the bowels, it will be useful to prescribe a weak infusion of some of the tonic bitters —as gentian, colomba and quassia. A tablespoonful of an infusion of this kind, with ten or twelve drops of *nitric acid*, may be taken morning, noon and evening.

Dr. Johnson recommends the following formula as an excellent tonic in this affection:

℞.—Decoct. taraxac. ℥iv.
Carbonat. sodæ ʒi.
Extract. taraxac. ʒij.
Tinct. gentian ʒij.—Misce. S. Take two or three tablespoonfuls twice daily.

"The more the taraxacum is employed," he says, "the more certain proofs will it afford of its utility." The aperient and diuretic qualities of this root are unquestionable.*

In speaking only of a moderate mercurial action, I refer particularly to this affection as it is usually met with in the *temperate* latitudes. In the intertropical regions, chronic hepatitis is generally much more rapid in its progress, and is much more apt to terminate in abscess than in the colder climates. In consequence of this it is often necessary to employ the mercury more freely, and to carry it to the extent of producing salivation. Chisholm and Johnson recommend the production of moderate ptyalism, and there can be no question of the general propriety of this practice in hot climates.

The nitro-muriatic acid bath was some years ago strongly recommended to the profession, as a remedy in this variety of hepatitis, by Dr. Scott, and it has since received the approbation of many other practitioners, whose opportunities for testing its virtues in this way were very ample. "As a general rule," says Dr. Scott, "it may be observed, that whenever the mercurial preparations are indicated, the nitro-muriatic acid will be found useful—with this difference, that in cases where mercury is highly injurious, from delicacy or peculiarity of constitution, or from other causes, the nitro-muriatic acid may be employed with safety and advantage." Dr. Johnson, who speaks very favorably of this remedy in chronic hepatitis, gives the following directions for using it. "Into a glass vessel capable of holding a pint or more of fluid, put eight ounces of water: and then pour in four ounces of nitric, and the same quantity of muriatic acid. One ounce of this mixture to a gallon of water will form a bath of a medium strength, The feet and legs of the patient are to be immersed in this bath at the temperature of about 96°, and kept there twenty minutes, or half an hour, just before going to bed. This should be done every night, and the same bath will remain good for five or six nights." If no prickling or itching sensation is felt in the feet and legs after they have been immersed for twenty or thirty minutes, more of the acid must be added to the bath. The nitro-muriatic solution may also be used with benefit in the form of a wash. Two or three drachms of the above mixture should be added to a pint of warm water, and the body and thighs sponged with it, night and morning, for fifteen or twenty minutes at a time. Mr. Annesley states, that "he found great advantage from employing this solution in the form of a poultice in torpor of the liver, and in chronic affections of the organ attended with enlargement, and a deficient and morbid state of the biliary secretion."

* Med.-Chir. Rev., Jan. 1829.

Mr. Annesley speaks in the most favorable terms of this remedy in chronic affections of the liver. Where the structure of this organ is enlarged, and the biliary and intestinal secretions disordered, he declares this mixed acid one of the most valuable remedies we possess." I have frequently used it in affections of this kind, and generally with marked advantage.

The internal use of the *nitrous acid* also has been found very beneficial in this affection. From two to four drachms diluted in a large portion of some mucilaginous fluid, may be taken in the course of twenty-four hours. It seldom fails to induce more or less ptyalism, when its employment is continued for some time; but it often acts beneficially without the production of salivation. It may be given simultaneously with mercury. (Annesley.) Sir James M'Grigor, indeed, thinks that peculiar advantages result from the conjoined use of these remedies.

Blisters are beneficial in chronic hepatitis; but I have generally seen more advantage derived from pustulation of the right hypochondrium by frictions with tartar emetic ointment. The *white precipitate* ointment forms a most excellent counter-irritating application in this affection. Two drachms of white precipitate, rubbed up with an ounce of lard, and applied two or three times daily by frictions to the region of the liver, will seldom fail to bring out a copious crop of large suppurating pustules, more permanent than those which are produced by *tartar emetic*, and much less painful and irritating. A seton in the right hypochondrium has been found very useful in the more chronic instances of this affection.

The diet should be light, unirritating and digestible; and the patient must especially avoid a cold and damp atmosphere; or the influence of sudden changes of atmospheric temperature. In general, persons who are affected with this disease are peculiarly sensitive to low temperature; and it is a matter of considerable consequence to the successful issue of our remedial efforts, to place such patients in a temperature perfectly agreeable to their sensations and uniform in its grade.

Sect. XII.—*Of Splenitis.*

The physiological relations of the spleen are as yet but very imperfectly understood; nor have the diseases to which it is subject been "either carefully studied or clearly revealed." "Our ignorance of its use during health has rendered us less alive to its conditions in disease; and the obscurity of its functions when natural, has made their study when disordered less interesting in its object, and less successful in its issue." It does not appear that this viscus is often the seat of *active* or acute inflammation,* although *chronic* inflammation is probably much more common than is generally suspected.† When *acutely* inflamed, the patient commonly feels a heavy pain under the false ribs of the left side, which is considerably increased by external pressure. The left hypochondrium is said to become fuller than natural, and in some instances, considerable pain is felt under the right scapula. The skin and eyes become slightly jaundiced, and the urine highly tinged with bilious matter. A burning and oppressive sensation in the stomach, with nausea and vertigo, particularly when the patient raises himself in bed, and other dyspeptic symptoms, frequently attend the affection.‡

In *chronic* splenitis, slight uneasy and occasionally painful sensations are from time to time experienced by the patient; and there is difficulty in lying on the left side, accompanied with dyspeptic symptoms, a cachectic aspect of the coun-

* [I have never seen more than one case of acute splenitis; and that was a decisive one. The tenderness of the tumefied organ was peculiar and excessive, and the constitutional disturbance was very severe. For three days the symptoms were alarming; but active depletion, general and topical, followed by active mercurial catharties, finally gave relief.—Mc]

† Richter thinks that *chronic splenitis* is even more common than chronic hepatitis.—*Die Specielle Thérapie*, band. i. s. 576.

‡ Marcus, vide Annalen der Medizin, band. vii. s. 327.

tenance, and a gloomy, morose, desponding, or variable and fretful temper. Persons affected with chronic inflammation of the spleen are said to be prone to attacks of vomiting of blood—(Marcus, Richter,)—more especially when the inflammation has terminated in induration of this viscus. The blood, perhaps, passes into the stomach through the *vasa brevia*.

From the foregoing symptoms, it is manifest that the diagnosis between this affection and *hepatitis* must always be attended with considerable uncertainty. The pain in the *left* side, and the vertigo when the head is raised, or on sitting up, are the only symptoms mentioned that are not as common in the latter as in the former affection.

Inflammation of the spleen may terminate in suppuration, softening of its structure, (*ramollissement*,) hypertrophy and induration.

Suppuration, however, occurs but very rarely in this affection. M. Jaquinelle relates an instance in which a large abscess in the spleen had burst into the colon; and Wardrop found nearly the whole structure of this viscus converted into an abscess containing a purulent fluid. Dr. Tweedie, physician to the London Fever Hospital, has related a case of inflammation of the spleen which terminated in suppuration; and Dr. Raikem, of Volterra, has given an account of a similar case. In Dr. Tweedie's case two abscesses were formed in the spleen, one in the centre, and another at the point of its adhesion to the diaphragm, the peritoneal covering and fibres of which it had destroyed. In Dr. Raikem's case, the interior of the spleen was hollowed out into one great abscess."*

Softening of the structure of this organ is a very common occurrence, particularly "after some forms of general disease." In fatal cases of typhus, ramollissement of the spleen is almost always present.† This softening consists of "a broken down semifluid pulp, resembling black currant jelly." (Abercrombie.)

Enlargement of the spleen is particularly apt to occur in remittents and intermittents. It is probable, however, that this condition is rarely the consequence of *inflammation*—being the result, generally, of great and protracted sanguineous congestion of this organ. During the cold stage of intermittents, the spleen always becomes greatly engorged with blood, and when this disease continues a long time, enlargement, induration, and sometimes a complete disorganization of this organ take place. Dr. Vetch states, that in the only three cases of intermitting fever which he has known to terminate fatally during the cold stage, the spleen was found so much distended with blood, and its structure so much altered, that it resembled a mass of dark uncoagulated blood, which was broken down by slight pressure of the finger. This state of the spleen is attended with great increase of its vascularity; whilst little or no morbid change usually occurs in its proper substance. Dr. Abercrombie observes, that "one of the most singular facts in the pathology of the spleen, is the very rapid manner in which enlargement of it takes place; and the equally rapid manner in which it subsides."‡

In some instances, *tubercles* and *hydatids* are found in the spleen; and authors mention a *pale induration* of this organ as an occasional phenomenon. (Diemer-

* Edin. Med. and Surg. Jour., April 1830.

† Dr. Vetch, physician to the Charter house, mentions the following symptoms as generally accompanying *enlargement* of the spleen. There is little or no pain complained of by the patient; "the appetite is usually good, yet the powers of assimilation are obviously deficient; the patient loses flesh;(a) is incapable of any muscular exertion; his features have a dark, bilious, or mahogany hue, but the conjunctiva preserves a white and healthy appearance; perspiration is in time wholly suspended, and the skin acquires the appearance and feel of satin; the lips are pale, and there is generally much wasting of the gums; the urine is limpid, and secreted very rapidly, but contains little or no urea. The patient's mind is desponding and morose; and there is coldness of the lower extremities."—*Med. and Phys. Journ.*, 1824.

‡ Med.-Chir. Rev., January 1829.

(a) [Infants are sometimes affected with permanently enlarged and very indurated spleens, which produce extreme anemia without any remarkable degree of emaciation. Dr. Elliotson thinks such cases proceed from the parents having been exposed to marsh miasma. I have seen them where no such cause could be suspected. Chalybeates and iodine are the only remedies; but my success has been poor enough with them.—Mc]

broeck.) Dr. Abercrombie mentions, also, infiltration of a gelatinous fluid, and deposition of adipose matter into the substance of the spleen.

Treatment.—Acute inflammation of the spleen is to be encountered with the usual antiphlogistic remedies proper in visceral inflammations. Decisive blood-letting, purgatives, and counter-irritating applications to the region of the spleen, constitute the principal means for combating this affection. The warm bath, after the active state of the disease has been in some degree reduced, is said to be a useful auxiliary.

In the *chronic* form of the disease, leeching and pustulation of the left hypochondrium by frictions with tartar emetic ointment; the warm bath; mercurial laxatives; a seton in the left side; alterative doses of blue pill with extract of hyoscyamus; diaphoretics; and the protracted use of minute doses of tartar emetic, are the remedies upon which our chief dependence is to be placed.

In enlargement and induration of the spleen, particularly when they occur as the sequelæ of intermitting fever, I have found no remedy more useful than large doses of the muriate of ammonia. The formula given in the chapter on intermitting fever may be employed with a pretty certain prospect of success in cases of this kind. Small doses of tartar emetic, also, are decidedly beneficial in enlargement of the spleen. One grain dissolved in two quarts of some bland fluid or water, may be taken in place of the common drink, and continued for eight or ten days. Alterative doses of blue pill with ipecacuanha, in the proportion of two grains of the former to one of the latter, will frequently succeed in removing this state of the spleen. The bowels must be regularly moved by some mild aperient; and the diet should be mild, digestible, and nourishing. The warm bath, and frictions with dry flannel or the flesh brush, will assist in the removal of this affection.

Iodine has recently been employed for the reduction of enlargement and induration of the spleen; and it would appear to possess very active powers against this affection. It may be used either internally in the form of tincture; in doses of from eight to ten drops three times daily; or in frictions with the hydriodate ointment, over the region of the spleen.*

CHAPTER XI.

OF THE PHLEGMASIÆ OF THE NERVOUS SYSTEM.

The pathology of encephalic inflammation is attended with much difficulty on account of the variety of structures which compose the encephalon, and the consequent diversity which occurs in the symptoms and terminations of its inflammatory affections. Within the cranium there are no less than three distinct structures, namely, the fibrous, the serous, and the cerebral, and there is reason to presume, that the phenomena of cephalitis will be considerably modified, according as one or the other of these structures is the principal seat of the inflammation. It is not probable, however, that any one of the structures within the cranium can suffer inflammation, without involving, in some degree, the others; and all attempts, therefore, to assign to each structure its peculiar symptoms under inflammation, must necessarily be attended with considerable uncertainty. Nevertheless, there are certain modifications of the phenomena of cephalitis, which observation has taught us to refer to particular structures, and which may,

* [The most decisive effects in enlargement of the spleen have been produced in my hands by occasional doses of Clutterbuck's extract of elaterium, in combination with a small proportion of calomel.—Mc.]

therefore, be taken as a basis for the division of encephalic inflammation into certain varieties, sufficiently distinct to demand separate consideration.

Agreeably to these circumstances, cephalitis presents us with the following varieties, viz:

Meningitis and *cerebritis*.—Meningitis must be again divided into inflammation of the *pia mater*, with more or less inflammatory action in the rest of the membranes and the brain; and *arachnitis*. The first of these subdivisions constitutes the affection commonly called phrensy (phrenitis;) and the last is known under the inappropriate name of *hydrocephalus*.

Sect. I.—*Phrenitis* (*Phrensy*).

Phrenitis generally begins with pain and a sense of fullness in the head, attended, in most instances, from the commencement, with considerable nausea and vomiting. As the pain and febrile reaction increase, the eyes become red and sparkling; the face flushed; and the patient often experiences a peculiar sensation of uneasiness along the course of the spine. Delirium is commonly an early attendant on the disease, and in most instances, soon acquires a degree of violence resembling the most furious and ungovernable mania. In this aggravated state of the disease, the face becomes turgid; the eyes wild and furious; the carotids beat strongly; vision is imperfect and deceptive; and the whole system is in a continued state of restlessness or agitation. During the early part of the disease, the sense of hearing is generally painfully acute, but in its advanced periods, complete deafness often occurs. At first, the pulse, along with its firmness and activity, has considerable volume; but in the progress it becomes *small* and tense, and not unfrequently intermitting. Respiration, though hurried and anxious at first, becomes slow, deep, and somewhat laborious in the latter stage of violent instances of the disease; and in many cases deglutition is performed with much difficulty.

The liver often sympathizes strongly with the brain in this disease, giving rise to a copious secretion of bile, jaundice, and other manifestations of hepatic derangement. Dr. Wilson observes, "that there is often a remarkable tendency to the worst species of hemorrhages from the bowels, towards the termination of fatal cases; an observation which was confirmed by a remarkable instance which came under my own notice. On the day preceding the fatal termination of this case, an exceedingly copious discharge of dissolved blood took place from the bowels, and on the following morning the hemorrhage occurred also from the mouth and gums.

Causes.—Phrenitis is not often an idiopathic affection. It occurs most commonly during the progress of general fevers, particularly synocha, and the aggravated instances of typhus. The ordinary exciting causes of this variety of encephalic inflammation are, violent passions; insolation; the sudden influence of cold while the body is in a state of free perspiration; drunkenness; suppression of habitual sanguineous discharges; and particularly metastasis of gout, erysipelas, and parotitis, and the extension of other external inflammations about the head to the brain, an occurrence sometimes met with in small-pox. I have known the disease to supervene in consequence of a large phlegmonous swelling under the left ear; and another instance, from a similar inflammation on the back of the neck.

Prognosis.—Hemorrhages, in the advanced period of the disease, particularly from the bowels, may be regarded as almost a certainly fatal sign. Bleeding from the nose, however, at an early period, seldom fails to mitigate the violence of the disease, and should always be promoted as a most favorable occurrence. Coma supervening on violent delirium, is indicative of great danger; for after the occurrence of this symptom, little or no hopes of recovery can be entertained.

Phrenitis is always attended with considerable danger; and the unfavorableness of the prognosis must of course be proportionate to the violence of the symptoms, and the obstinacy with which they resist remedial treatment. Morgagni observes, that when phrenitis supervenes on peripneumony, the worst consequences are to be apprehended; and the same observation is made by Schmidtmann.*

Pathology.—It is stated above, that in the disease just described, the inflammation is principally located in the *pia* and *dura mater;* and this appears to be entirely confirmed by the phenomena which are presented on post-mortem examination. I am aware, that Bichat asserts that the *dura mater* is scarcely susceptible of inflammation;† but this assertion is contradicted by others, and with justice. Shaw, in his Manual of Anatomy, states, that after phrenitis, the traces of inflammation are always very conspicuous on the surface of the dura mater, "which is generally as much blood-shot as the conjunctiva in ophthalmia, with layers of lymph occasionally on the inner surface." The observations of Morgagni, also, go to establish the same fact; for, in nearly all the dissections which he relates of subjects who had died of this disease, the *pia* and *dura mater* showed the strongest signs of previous inflammation. The substance of the brain itself does not often exhibit unequivocal traces of inflammation in those who die of phrenitis; but in nearly all instances, flakes of coagulable lymph, and often pus mixed with serum, are found between the membranes, and in some cases the dura mater has been found eroded to a considerable extent. (Morgagni.) Indeed, inflammation of the *cerebral* substance alone is very rarely attended with the violent delirium and pain which distinguish the affection under consideration; nor is delirium a very constant and prominent phenomenon of *arachnoid* inflammation, though frequently connected with very severe and lancinating pains in the head. It cannot, indeed, be doubted, that the brain becomes more or less involved in the inflammation which constitutes this disease, but the principal seat of the inflammation would seem to be placed in the pia and dura mater. Morgagni states, that he has found the membranes alone affected, although, in the majority of cases, traces of inflammation were also discovered in the cerebral structure.

Treatment.—There is no inflammatory affection which more urgently demands a vigorous antiphlogistic treatment than the present one. Blood-letting, promptly and efficiently used, is a *sine qua non* in the remedial management of this affection, as indeed it is in all the modifications of cephalitis. Many of the other phlegmasial diseases may often be treated successfully without sanguineous depletion. Pneumonia is treated by some‡ with opium and calomel; and by others,§ with tatar emetic, with little or no abstraction of blood. But phrenitis is, perhaps, never treated with success without efficient blood-letting, nor is it likely that any other remedial measures would be of adequate avail, without the aid of this most prompt and efficient of all our antiphlogistic means. Blood should be drawn from a large orifice, and suffered to flow until unequivocal signs of its effect on the action of the heart and arteries are manifested. Carried to the extent of inducing an approach to syncope, bleeding will generally speedily subdue the furious delirium and intense pain in the head. In all inflammatory affections of the head, particular advantage may perhaps be obtained by taking the blood from one of the jugulars or the temporal arteries. Although bleeding is always most serviceable when adequately performed in the onset of inflammatory affections, yet in the present disease it may be advantageously resorted to throughout the whole course of the malady, if the pulse remains tense and quick.‖ Topical bleeding by leeches or cups, is less beneficial in this than in

* Summa Observationem Medicarum, vol. i. Berlin, 1819.
† Pathological Anatomy, translated by I. Togno, M. D., p. 58.
‡ Schmidtmann, Vogel.
§ Rasori, and the advocates of the contra-stimulant doctrine.
‖ [After the first blood-letting the pulse should be carefully watched, and at every subse-

the less violent forms of encephalic inflammation in its early stage.* After the momentum of the circulation has been diminished by general bleeding, leeches or cups, applied to the temples and about the head, will in general procure considerable advantage. The application of *cold water* or *ice* to the head is a valuable auxiliary in the treatment of this disease. The hair should be cut short, or shaved off, and bladders partly filled with cold water, into which a lump of ice is put, should be kept constantly applied to the top of the head. Purgatives of the active kind will assist materially in reducing encephalic inflammation.

In all affections of the head, whether congestive or inflammatory, there is usually considerable torpor of the intestinal canal, and it is generally necessary to prescribe large doses of some active purgative to procure an adequate evacuation of the bowels. As the liver usually sympathizes strongly with the brain in its inflammatory affections, calomel forms an appropriate constituent in the purgatives proper in this disease. From ten to twelve grains of this article, followed after the lapse of three or four hours with infusion of senna, or a full dose of Epsom or Glauber's salts, will in general answer well as a purgative in this affection. Care must be taken in the use of calomel, lest ptyalism be induced, an occurrence which could hardly fail proving injurious. The bowels should not be suffered to remain inactive for more than five or six hours at a time, and this should be attended to, not only during the active course of the disease, but throughout the period of convalescence. Cathartics do good in this affection, both as revulsive and evacuant means. By exciting the intestinal exhalents, and thus directing the circulation more particularly to them, purgatives tend, in no inconsiderable degree, to diminish the flow of blood to the head, as well as the general momentum of the circulation, by their indirect depletory effects, and the removal of irritating matters from the intestinal canal.

Many writers recommend the application of blisters to the head, after the violence of the febrile excitement had been in some degree subdued by the depletory measures. In the early periods of the disease they are useless, and perhaps injurious, but when the violence of the inflammation is moderated, and the disease, as it were, lingering on the confines of convalescence, advantage may, perhaps, be derived from vesicatories applied to the shaven scalp. It has appeared to me, however, that more benefit is derived in the inflammatory affections of the brain, from blistering the back of the neck, than from vesicatories laid on the top of the head. When applied on the neck we may at the same time continue the use of cold applications to the scalp, a union of applications particularly appropriate to this disease.

The patient's head should be kept in an elevated position, in order to lessen the impetus of the circulation in the affected parts. In all inflammations, considerable benefit accrues from placing the inflamed part, if feasible, in a raised position, as we thereby favor the return of blood from the inflamed structure by the veins, and impede, in some degree, the access of the blood by the arteries, in consequence of the additional resistance offered by the gravity of the blood to the propulsive efforts of the heart.

Among the internal antiphlogistic means, *nitre*, in combination with *antimony*,

quent reaction the bandage should be removed, and more blood drawn from the same orifice. I have in this way repeated the evacuation several times on the first day with the most decisive effect.—Mc.]

* Mr. Chauffard states that he has often seen an inflammatory affection of the head aggravated by leeches to the temples or behind the ears, and relieved at once by drawing blood from the feet and ankles. He mentions several cases of ophthalmia, unchecked and uncured by local bleedings from the neighborhood of the eyes, speedily disappear by the application of leeches to the lower extremities. The good effects are much enhanced by the warm hip or foot baths; cold applications at the same time kept constantly applied to the head.—*Med.-Chir. Rev.*, 1832, p. 188.

Dr. Johnson observes that "revulsive bleeding" may be used with exceeding good effects, especially in those cases of cerebral disease dependent on obstruction of any accustomed discharge.

or *digitalis*, may be accounted the most useful. From ten to twelve grains of the nitrate of potash, with half a grain of digitalis, may be given every two hours. Digitalis is particularly well suited to the management of this, as well as of other inflammatory affections, after the violence of the disease has been broken down by the remedies already mentioned, and when it continues its course in a reduced or subacute form. Given in small and frequent doses, it will, under these circumstances, often make a very decided and salutary impression upon the action of the heart and arteries. From a quarter to half a grain of the powdered leaves may be given every two hours, until it either causes a reduction of the frequency and activity of the pulse, or produces nausea or other symptoms of gastric disturbance.

During the whole course of the disease, the chamber of the patient should be kept dark, silent, and cool, and everything avoided which has a tendency to disturb or excite the system. No nourishment whatever, with the exception of toast-water and lemonade, or similar beverages, must be allowed, so long as there are pain in the head, and general febrile irritation.

Sect. II.—*Arachnitis.*

Hydrocephalus acutus; acute dropsy in the brain; apoplexia hydrocephalica—(*Cullen.*) *Encephalitis*—(*Porter.*) *Phrenicula*—(*Rush.*) *Hydrencephalus*—(*Smith.*) *Cephalitis profunda*—(*Good.*)

Arachnitis is a much more common form of encephalic inflammation than the preceding one.* It has of late years been extensively investigated by Martinet and Duchatelet, of Paris, and by Dr. Abercrombie of Edinburgh, whose pathological researches in relation to this subject are highly interesting and valuable. I treat of hydrocephalus and arachnitis under the same head, for it is now placed beyond all doubt, that the malady known and described under the name of *hydrocephalus*, consists essentially of arachnoid inflammation. The term hydrocephalus is, indeed, altogether inappropriate to the disease; for, instead of directing the mind to the primary and essential affection, it has reference only to *one* of its ordinary consequences—namely, serous effusion on the surface and within the cavities of the brain. Dr. Rush was one of the first who taught correct views concerning the pathology of this disease. "Having for many years," he says, "been unsuccessful in all cases but two of internal dropsy of the brain which came under my care, I began to entertain doubts of the common theory of this disease, and to suspect that effusion of water should be considered only as the effect of a primary inflammation in the brain." He regarded this disease as a subacute grade of cerebral inflammation, or an inflammation less violent than that which gives rise to the symptoms of phrenitis, and therefore distinguished it by the name of *phrenicula*.† The impropriety of designating this disease by the name of *dropsy*, is often strikingly exemplified by the post-mortem phenomena; for, in some instances, very little or no serum is effused into the ventricles, or upon the surface of the brain, although the symptoms were unequivocally those which are acknowledged to characterize hydrocephalus.—(Abercrombie.)‡

* Dr Coindet states, that in France, 20,000 deaths occur of this disease annually, while Dr. Alison informs us, that 40 out of 120 patients die of this affection in the New-Town Dispensary; and according to the late Dr. Davis, of London, 8 out of 45 deaths in the Universal Dispensary were produced by hydrocephalus.—*Med.-Chir. Rev.*, March 1828, p. 385.

† Dr. Porter contends that hydrocephalus is not phrenitis, (though he admits that meningitis may be superadded,) but an inflammatory condition of the posterior arteries of the encephalon, and of the base of the brain.—*Med.-Chir. Journ.*, July 1819.

‡ [In the majority of all the cases in which I have made *post-mortem* examinations for acute hydrocephalus in children, I have been disappointed in regard to the anticipated effusion. Inflammation of the enveloping and penetrating portion of the membranes has always predominated, and often the cerebral injection has terminated in bloody extravasation.—Mc.]

It is, nevertheless, probable that effusion within the cavity of the cranium does sometimes occur without inflammatory action of the vessels of the encephalon, from mere congestion of the cerebral blood-vessels. This is, perhaps, the case in some of the instances which are ushered in by convulsions, or a state of somnolency and stupor, without any manifest previous febrile irritation. Be this as it may, arachnoid inflammation constitutes unequivocally the essential pathological condition of what is generally known under the denomination of hydrocephalus.

Arachnitis occurs most commonly during childhood; and the period of dentition is the age during which the greatest aptitude exists to the disease. That there should be a particular proneness to this malady during the process of dentition is easily to be understood. Whilst this process is going on, there is almost always more or less local irritation in the immediate vicinity of the brain, connected with a general irritable and phlogistic condition of the system—circumstances which, co-operating with the natural predominance of the cerebral circulation in infancy, are well calculated to invite to inflammatory affections of the head during this period of life.

Symptoms.—Arachnitis may be divided into three stages. The first stage may be called the *irritative* period; for, in the commencement of the disease, the symptoms are those of an *irritated*, rather than an inflamed condition of the brain. The approach of the disease is frequently very gradual, more especially during early childhood. In many instances, the brain manifests a very irritable condition for several weeks previous to the full development of the disease. The patient is wakeful; irritable in temper; evincing a repugnance to strong light, on account of the sensible state of the retina; the pupils are contracted; the disposition fretful and variable; small children cry frequently, without any apparent cause, and, when sleeping, often start or awake suddenly, with violent screaming, "and an expression of terror in the countenance." Nurslings, when awake often "start at the slightest noise, and shriek suddenly as if pricked with a pin."* This state of cerebral irritability sometimes exists and continues for a time without passing into the inflammatory state; the child gradually returning to its ordinary condition of health. When, in this state, some additional exciting circumstances supervene—such as cold, dentition, or intestinal irritation from improper food, or other irritating substances lodged in the bowels, this irritative condition of the brain is increased, and sooner or later converted into inflammation. A new train of phenomena now ensues, which characterizes the *inflammatory*, or second stage of the disease. The patient complains of transient pains in the head, alternating often with similar pains in the abdomen. The restlessness and irritability of temper increase; the pulse is irritated, quick, tense and active; the physiognomy expressive of discontent and suffering; one or both cheeks marked with a circumscribed flush; the eyebrows knit and frowning; and the eyelids generally half closed, on account of the sensible state of the retina. The bowels are commonly torpid, and sometimes relaxed, the stools presenting an unnatural appearance. As the disease goes on, the cephalic pains become more and more severe, suffering occasional remissions, and sometimes subsiding entirely for a few minutes. These pains are felt chiefly in the forehead, shooting backwards towards the temples. Children manifest their sufferings from the headache, by frequently applying the hands to the forehead. At this period of the disease, the stomach is usually very irritable—the retching and vomiting becoming often very troublesome, particularly when the patient is raised to a sitting posture. I have met with many instances in which no disposition to vomit was manifested whilst the patient remained in a recumbent position; but the moment the head was raised from the pillow, sickness and vomiting ensued. Indeed, children affected with this disease always bear the erect position with great uneasiness.

* Dr. W. Nicholl's Transact. of the Association of Fellows and Licentiates of the King and Queen's College, Dublin, vol. iii. Practical Remarks on Disordered states of the Cerebral Structures occurring in Infants. By W. Nicholl, M. D., London, 1821.

"In the early part of the disease, the little patient cannot sleep with the head low; he lies in the bed with outstretched arms, which have a tremulous motion; are often directed towards the head, and firmly clasped upon it; he is constantly turning and tossing from one side of the bed to the other, and very frequently groans much, as if under the influence of pain." (Monro.) The sickness of the stomach sometimes alternates with the cephalic pains. (Quin, Fothergill.) One of the most common and characteristic symptoms of this complaint is frequent and deep sighing; though this is seldom much noticed until the disease is fully developed, and is generally most remarkable about the period when the inflammation is about terminating in effusion. During the latter part of the inflammatory stage, transient delirium usually occurs: but the delirium of arachnitis is never violent or furious, but of the tranquil kind, and rarely so great that the patient may not be roused from it, so as to give distinct answers. (Martinet.) The skin in this stage is generally above the natural temperature, and dry; the tongue, for the most part, remains clean, or covered only with a thin white fur, with pale red edges. In cases, however, which depend on gastric irritation, it is apt to be covered with thick brown fur, becoming dry and rough towards the termination of the disease. After an indefinite period, these inflammatory symptoms are succeeded by a new train of phenomena, marking the third stage or the period of cerebral oppression. The delirium is now more continuous; the countenance exhibits an aspect of surprise and stupor; the pupils are dilated or much contracted; the conjunctiva is suffused and reddish; the eyes turned up under the upper lids during sleep; constant somnolency supervenes, the patient being wholly inattentive to surrounding objects, and when roused, speedily relapses into the same somnolent state. The mind is torpid, and apparently incapable of any attention. The drowsiness increases more and more, until a complete state of coma ensues. In some instances, the coma comes on suddenly in conjunction with paralysis of one side of one extremity; but it more commonly approaches in the gradual manner just described. Indeed, instances occur, in which no febrile excitement is developed, the first manifestations of the disease being an unusual drowsiness or torpor. In this latter case, arachnoid inflammation exists, no doubt, without showing itself by its usual symptoms; for it is well ascertained that inflammation may go on in the brain, even to the extent of terminating in extensive and fatal disorganization, without causing either pain or any other general symptoms characteristic of inflammation. Soon after the somnolent stage supervenes, paralytic affections generally occur. A tremulous motion of one arm, with the hand firmly contracted inwards, is usually one of the first manifestations of paralysis in infants; and, by degrees, the power of using the arm and leg of one side becomes entirely lost; one or both upper eyelids usually becoming paralyzed at the same time, so that the patient, in endeavoring to look at anything, is unable to raise the lids by their proper muscles, and is, therefore, obliged to draw them up with the integuments of the forehead, by the contraction of the occipito-frontalis muscle.* Previous to the occurrence of paralysis, strabismus almost always occurs, and in many instances, there is double vision. In general, a sudden amendment in nearly all the symptoms takes place soon after the inflammation has terminated in effusion; and parents and friends, nay, even physicians, may be deceived into the hope that the disease is about assuming an unexpected favorable change. This flattering calm is, however, seldom of long continuance, and almost universally ultimately fallacious; for, sooner or later, convulsions suddenly supervene, or the patient relapses into a state of fatal coma and stupor. Convulsions rarely, if ever, remain wholly absent towards the fatal termination of this disease. During the somnolent stage, the pulse is generally slow and full, and often irregular; but in the convulsive or paralytic period, it becomes frequent, small and irregular. In the latter stage of the disease,

* Recherches sur l'Inflammation de l'Arachnoide, Cerebrale et Spinale. Par Parent Duchatelet et L. Martinet. Paris, 1821.

both hearing and seeing are often totally lost, yet general sensibility, or the sense of touch, usually remains to the last moments. I have seen infants, perfectly deprived of the sense of seeing, and apparently of hearing, readily lay hold of the nipple and suck as soon as it was brought in contact with the lips, although in a continued state of stupor or sleep. The paralysis which occurs in the latter stage is always of the hemiplegic kind. In most cases, small children keep one arm in continued motion. (Cheyne.) Martinet and Duchatelet state, that patients suffering under this disease exhale a very disagreeable odor, which they compare to the smell of mice.

Arachnitis does not, however, always come on in the gradual manner and with the regular train of symptoms just described. Sometimes the disease commences and proceeds in a manner very similar to the infantile remittent; and at others it is ushered in by convulsions, without any perceptible antecedent febrile irritation. In this latter case, however, there is, perhaps, always some evidence of ill health, previous to the supervention of the convulsion, such as fretfulness, variable appetite, irregular state of the bowels, tumid abdomen, foul breath, swelled upper lip, starting, and grinding the teeth, during sleep, and other symptoms indicative of intestinal irritation. I have known the disease to commence and proceed to the last stage with scarcely any other symptom than slight febrile irritation, with little or no pain in the head, but a *constant and nearly ineffectual* desire to pass urine. In one instance there was not above a gill of urine discharged in twenty-four hours during the first five days of the malady, and no other particular morbid condition was perceptibly present. In this case the urine was not retained, for the introduction of the catheter brought off none. Dr. Monro observes, "that there are cases in which the little patient has a desire every hour to pass water;" and states that he "attended a child affected by this disorder, who passed for some days very little urine." The liver generally sympathizes strongly with the brain in its inflammatory affections. During the former stage of the present complaint there is usually a deficiency of bile; but in its advanced periods, the bile is not only more copious, but vitiated in its quality—the stools acquiring from its admixture with the ordinary secretions and contents of the bowels, a dark glairy, or deep green appearance, resembling, as Dr. Cheyne observes, "*chopped spinage.*"

Diagnosis.—The characteristic symptoms of the first stage are: irritability of temper; irregularity of the bowels; variable appetite; starting in sleep; transient flushes of the face; an irritated, quick pulse, an occasional frowning expression of the countenance; wakefulness; and grinding the teeth. In the second stage: more or less continued pain in the head; torpor of the bowels; nausea and vomiting, particularly on assuming the erect posture; irregular febrile exacerbations; a peculiarly distressed expression of the countenance; sudden starting from sleep; transient acute pain in the abdomen; a circumscribed flush on *one* cheek; intolerance of light and sound; hot and dry skin, with frequent, tense, and generally active pulse. In the last stage: constant somnolency; torpor of the intellectual functions; strabismus; paralysis of one or both upper eyelids; more or less hemiplegia, coma, and convulsions. From *infantile remittent*, arachnitis differs in the great irregularity, both in relation to duration and time of recurrence of the remissions and exacerbations of the second stage. The appearance of the stools, too, will often assist us in the diagnosis between these two affections. In infantile remittent, the alvine discharges are fetid and of a dirty brown color; in arachnitis, they frequently have a glairy and dark green appearance. (Cheyne.) Dr. Coindet states that a micaceous deposition like crystals of boracic acid in the urine, is almost peculiar to hydrocephalus in its second stage.

M. Gintræ (*Journal Générale de Médecine*, 1825) gives the following, among a number of other diagnostic symptoms, between idiopathic arachnitis or cerebral fever, and infantile remittent, or fever from intestinal irritation. In idiopathic cerebral fever, the abdomen becomes flattened; in infantile remittent, or fever from intestinal irritation, from worms, &c., the abdomen is almost always tumid

and hard. In the former affection, costiveness almost invariably attends, and when alvine evacuations do occur, they are generally green, slimy, or gelatinous: in the latter disease, there is frequently more or less diarrhœa, the motions being brown, mucous and fetid. In idiopathic cerebral fever, the secretion of saliva is diminished: in fever from verminous irritation, it is generally increased. (Brera.) In cerebral fever, the tip and edges of the tongue are usually red: in fever from intestinal irritation by worms, the root and middle of the tongue are covered with a thick fur. In idiopathic cerebral disorder, the pain in the head is often extremely severe and continuous; in verminous fever, the pain is less severe, being obtuse and vague, the child seldom complaining of it as particularly distressing. In the former affection, the patient often directs his hand to the head; while in the latter, "it is usually to the nose that the fingers are directed, in consequence of the itching there." In verminous fever, we often perceive a movement of deglutition during sleep, and hiccough, with occasional slight convulsive movements of the thumb and index finger. In the idiopathic cerebral disease, the nostrils are dry; in fever from verminous irritation, they are usually moist. In the former there is often a circumscribed flush on one or both cheeks: in the latter, the face is commonly pale and leaden. In cerebral disease, the temperature of the head is above that of the abdomen: in intestinal irritation, the reverse obtains. In the former, the urine is small in quantity, red, and sedimentous: in the latter, it is sometimes clear and abundant; frequently whey-like, depositing a white sediment.

Dr. Johnson very justly observes, however, that "there is no one pathological symptom, which can be depended on as characteristic of idiopathic cerebral fever, nor yet of the intestinal." Our conclusions must be drawn from the whole of the symptoms taken collectively.

Dr. Alexander Monro has described a variety of hydrocephalus, which he calls the "hyper-acute form" of the disease, a form of very rare occurrence, and simulating, in some of its most striking symptoms, inflammatory croup. "This rare form of the disease is very sudden in its attack. There are no previous headache, drowsiness, stupor, nausea, vomiting, paralytic state of any part of the body, or any other symptom denoting a derangement of the functions of the nervous system. It begins like croup. The child awakens in the night in a state of extreme agitation, and much flushed, and with a quick pulse; he is hoarse, and the sound of the voice when he inspires is similar to that of croup. The patient, at the onset of the disease, seems in a state of nervous irritation; often starts in his sleep, and in a short time the disease assumes the appearance rather of a spasmodic affection of the larynx than of the inflammatory croup. The matter thrown up by vomiting, consists generally of indigested food. The longer the disease continues, the shriller and hoarser the voice becomes."

In the dissections which were made of children who died of "this form of the disease, Dr. Monro found in one instance, the vessels of the pia mater at the corpora quadrigemina and tractus optici, and at the origin of the eighth pair of nerves, much distended with blood. No morbid appearance was discovered in the larynx and trachea." In another case, "the upper part of the brain, particularly the superior part of the posterior lobes, was covered with a transparent gelatinous effusion;" and about an ounce of colored serum was found in the ventricles. "The vessels of the spinal marrow were turgid, those of the cervical portion of a vermilion-red color, and those of the lumbar portion of a dark-red hue. *The eighth pair of nerves* was of a deep uniform red color along its whole tract, as far as its branches, going to the lungs."

Dr. Burns attributes this form of hydrocephalus "to an affection of the origin of the eighth pair of nerves, induced by the state of the extremity of the fifth pair in dentition acting on its origin, which is near the eighth."*

Post-mortem appearances.—In some cases the arachnoid membrane is minute-

* The Morbid Anatomy of the Brain. By Alexander Monro, M. D., 1827.

ly injected throughout its whole extent; in others it is opaque and thickened. On its surface, "a purulent, sero-purulent, or sero-gelatinous exudation" is a very common phenomenon; and it is still more common to find a greater or less portion of serum effused into the ventricles, between the lamina of the arachnoid, and into the cellular tissue between this membrane and the *pia mater*. (Martinet.) In some instances, however, little or no serum is found effused. Out of twenty-six cases related by Martinet and Duchatelet, there were eight, in which scarcely any trace of effusion into the cavities, or on the surface of the brain occurred. In some instances, the *substance* of the brain was altered in its consistence and color; and in a few cases the whole surface of the arachnoid was covered with a false membrane.

Causes.—It would seem that in some instances a hereditary or constitutional predisposition to the disease exists. I have known families of which nearly all the children died during the period of dentition from arachnitis. It has been affirmed, also, that children of a scrofulous diathesis are peculiarly liable to this affection, an observation which appears indeed to be well founded. In general children of an irritable habit, with weak or deranged digestive powers, seem to be most liable to this disease. Dr. Mills* states that in a large proportion examined, the appearances of scrofula were evident. And Percival observes that out of twenty-two, eleven cases "were decidedly scrofulous."†

Among the most common exciting causes are, blows, falls, or other injuries of the head, causing more or less concussion; insolation (*ictus solus*), suppressed habitual evacuations or repelled chronic cutaneous eruptions; metastases of different kinds, intense and long-continued mental application, the intemperate use of ardent liquors, the protracted influence of the depressing passions, dentition, intestinal irritation, hooping-cough, cold, and, in short, whatever is capable of at once deranging the digestive organs and causing a preternatural determination of blood to the brain. The most common cause of arachnitis during childhood, however, is the combined influence of dentition and intestinal irritation on the brain. If, while painful dentition is going on, the digestive functions suffer derangement from improper diet or some other circumstance, there will be two powerful causes of cerebral irritation and congestion present, which, under the general derangement of health which necessarily attends, will tend peculiarly to develop this fatal malady. *Intestinal irritation* is, indeed, very frequently the exciting, or perhaps, rather the predisposing cause of infantile arachnitis. The variable appetite, the irregular action of the bowels, and frequent unnatural appearance of the stools, the tumid abdomen and gastric tenderness, the picking and rubbing of the nose, and the pale and sickly aspect of the countenance which so often precede the development of the disease, all point to the alimentary canal as the probable source of the primary irritation with which the brain sympathizes. When such gastric irritation exists, the supervention of any additional exciting cause, such as a severe fall, or blow on the head, painful dentition,

* A Pathological Inquiry into the Nature of Hydrocephalus. By Thomas Mills, M. D., &c. Dublin Hospital Reports.

† [It has long been understood that a scrofulous diathesis is peculiarly liable to hydrocephalus. Indeed, Dr. Cheyne suggested that the hereditary disposition to this disease is altogether derivable from that source. He also, with Sprengel, considered hydrocephalus and scrofulous affections as mutually convertible into each other. Careful practitioners have always been influenced by this idea to refrain from repelling strumous eruptions, and of suddenly healing up ganglionic abscesses and fistulas in young children. Laennec and others pointed out the existence of granular tubercles in the cerebrum, cerebellum, and spinal cord; and the appearance of small opaque tuberculous masses along the course of the large veins of the pia mater and the longitudinal sinus, compared by some to the glands of Pacchioni, has long been recognized in hydrocephalus and other diseases of the brain. Dr. Gerhard, of this city, has lately called the attention of the profession to this subject more particularly, and gives strong countenance to the idea that the development of scrofulous tubercles is universal in the brains of hydrocephalic children. In conjunction with Dr. Rufz, in Paris, he derived this idea from an examination of about forty cases which terminated fatally in the children's hospital of Paris. He proposes to denominate the disease *tubercular meningitis*.—Mc.]

cold, &c., will often speedily develop this fatal malady. An interesting fact, corroborative of the observation that arachnitis and consequent effusion into the cavities of the brain are especially apt to result from intestinal irritation, is the circumstance that *cholera infantum*, when it assumes somewhat of a chronic form, terminates not unfrequently in death, under all the characteristic symptoms of the last stage of hydrocephalus. In two instances of this kind, in which I had an opportunity of a post-mortem examination, I found the traces of arachnoid inflammation unequivocal, with copious serous effusion into the ventricles, and between the circumvolutions of the brain.* While we give all the importance to intestinal irritation, as a cause of arachnoid inflammation, which it unquestionably demands, we must bear in mind that this same cause sometimes gives rise to a form of cerebral oppression strongly resembling the last stage of arachnitis, but which is, nevertheless, wholly unconnected with cephalic inflammation. The determination to the head, in such cases, results merely in a state of strong venous congestion of the brain, giving rise to a somnolent and oppressed state of the system, which may be readily mistaken for hydrocephalus. (Cheyne.)†

Treatment.—There are three principal indications to be kept in view in the treatment of arachnoid inflammation—viz: 1, to moderate the general arterial action; 2, to obviate the local congestion and inflammatory action in the brain; and 3, to remove those causes of irritation which tend to keep up a preternatural determination of the blood to the head.

When the disease becomes the object of medical attention in its *early* and incipient stage, the chief indication is to obviate local and general irritation, and to prevent undue determination of the blood to the head. With this view, the attention is to be particularly directed to the alimentary canal, for it is here that the primary irritation and immediate cause of cephalic congestion most commonly exist. *Laxatives* are, accordingly, among our most valuable means for preventing the full development of the disease whilst it is yet in its incipient stage; and this is more especially the case in those instances which are attended with well-marked signs of intestinal disorder. As the liver is usually inactive, or functionally deranged, in the commencement of the disease, *calomel*, in small doses, succeeded by small portions of some of the milder purgatives, constitutes a very appropriate aperient in this affection. From one to two grains of this preparation should be given in the evening, followed next morning with a weak dose of Epsom salts, or of powdered rhubarb, for a child of from one to five years old. In some instances of impending arachnitis, with manifest intestinal and hepatic derangement, in children, I have derived much benefit by giving a grain of blue pill every evening, followed by a few drachms of castor oil in the morning. The aperient and mercurial remedies should be continued daily until the alvine discharges exhibit a natural appearance. In addition to these means the greatest attention must be given to the dietetic management of the patient; for without an appropriate diet little or no advantage can be derived from remedial treatment of this affection. The most simple and unirritating articles of food alone must be allowed, such as boiled milk, barley-water, arrowroot, boiled rice, oatmeal gruel, week beef or chicken tea, &c.

When the arachnoid inflammation is once fully established, the plan of treatment should be promptly and decisively antiphlogistic, with revulsive and deri-

* An interesting and striking case, in which hydrocephalic symptoms were produced by organic disease of the intestinal canal, is related in the *Med. and Chir. Rev.*, July, 1826, p. 102.

† Some writers contend, that hydrocephalus is almost invariably a sympathetic affection. Dr. Yeates, in particular, thinks that this disease has almost invariably its origin in the irritation of some organ remote from the brain (*a*) Spurzheim admits that the primary irritation is frequently located in the abdomen; "yet anatomical dissections have convinced me," he says, "that, in the greater number of cases, the morbid appearances of the abdomen are secondary of the cerebral disease."

(*a*) Letter to Dr Wall, &c.—*Med.-Chir. Jour*, Jan. 1819.

vative application. *Blood-letting* ranks of course among our most efficient remedial means at this period of the disease, particularly when the inflammation is the consequence of some injury inflicted on the head, or where it results from general causes, such as cold. In such instances, the pulse is tense, quick, resisting and sharp; and in this case, the efficient abstraction of blood is indispensable. In those cases which arise sympathetically from disorder in the alimentary canal, the arterial excitement is not generally very active. Here blood-letting, though usually indicated, must be employed with more caution, for it is well ascertained that the copious abstraction of blood, by weakening the powers of vital resistance, greatly favors the morbid sympathetic affections arising from intestinal irritation. (Armstong, Marshall Hall, Travers.) In all instances, however, where the pulse indicates blood-letting, a sufficient quantity of blood should be taken away at once, to check, conspicuously, the activity and momentum of the circulation. After the symptoms of cerebral compression have ensued, sanguineous evacuations can be of little or no service; nevertheless, should the arterial excitement and cephalic congestion be considerable, blood should be abstracted even in this advanced stage of the disease.

With regard to the utility of *local bleeding* in this and other forms of encephalic inflammation, different opinions are expressed by practitioners. Nearly all the French writers on this disease are decidedly in favor of the local abstraction of blood. It appears, indeed, very reasonable to expect peculiar advantages from a mode of depletion which abstracts the blood more immediately from the affected parts; and yet, in relation to the present disease, a contrary opinion has been expressed by several eminent practitioners. Mr. North, in his work on the convulsive affections of infants, observes, "that he never found well-marked symptoms of determination to the head removed by leeches, however freely they were applied." In cases in which the cephalic determination depends on *intestinal irritation*, this observation is no doubt well founded; for the blood which may be thus removed from the capillaries of the head, will be immediately replaced by the continued preternatural afflux of this fluid. It must be observed, moreover, that so long as the momentum of the general circulation is considerable, local bleeding can scarcely produce any other advantages than such as would result from abstracting the same quantity of blood by means of the lancet. General and adequate bleeding is, therefore, an essential preliminary to the beneficial employment of leeches or cupping. After the impetus of the circulation has been moderated by the use of the lancet, *leeching* the temples, and along the posterior parts of the ears, is a valuable auxiliary in the treatment of arachnitis. Cupping is, perhaps, preferable to leeching in adults, for this operation seems to be better calculated to derive the circulation from internal inflamed parts than leeches.

Purgatives are among our most useful means for subduing this disease. When the bowels are loaded with irritating substances, and the cerebral affection is symptomatic of intestinal irritation, laxatives are, in truth, the main stay of our hopes. They are, indeed, almost equally useful in idiopathic arachnitis; for, besides their effect in evacuating irritating causes, they tend, very particularly, to diminish the afflux of blood to the brain, and to moderate the general momentum of the circulation. In cases depending on a primary irritation of the alimentary canal, the *milder laxatives*, after the first thorough evacuation of the bowels by an active purge, should be employed in such a way as to keep the bowels in a relaxed state throughout the whole course of the disease. Repeated doses of the more *active purges*, though at first apparently useful in such cases, tend ultimately to increase the intestinal irritation, and consequently the cephalic affection. The first purge should be sufficiently active to evacuate the bowels well. Four or five grains of calomel, followed in a few hours by the occasional use of the infusion of senna and manna until free purging is produced, will answer well as a first purgative. The bowels must afterwards be regularly evacuated three or four times daily, by the use of small doses of calomel, promoted by

castor oil and laxative enemata. It must be recollected that intestinal irritation is not always dependent solely on the presence of acrid or irritating matters in the bowels. The mucous membrane of the alimentary canal may be in a state of subacute inflammation, with more or less of abrasion, or perhaps ulceration. Under these circumstances, the milder *laxatives* are manifestly more appropriate than the more irritating articles of this class, since they are sufficient to evacuate the contents of the bowels, without causing injurious irritation. In idiopathic arachnitis, however, the bowels are almost always very torpid, and can seldom be adequately moved, without the employment of the more active purgative remedies. In cases, too, that are attended with a great accumulation of fecal matter in the bowels, brisk and frequent purgation is particularly necessary. "Should we ascertain," says Dr. Cheyne, "that the alimentary canal is torpid, and imperfectly performing its functions, and admitting an accumulation of fecal matter, or that the secretions flowing into it are vitiated or diminished in quantity—circumstances which we ascertain by the peculiarity in the appearance or the pungent fetor of the stools, we must, by steadily pursuing the purgative plan, endeavor to effect a change; for while this is produced in the appearance of the stools, we are effecting a more important change in the hepatic system of the alimentary canal, and of all the parts which are connected with them."

Calomel should enter largely into the purgatives employed in this disease. From one to three grains, according to the age of the patient, may be given every two or three hours, until from ten to twelve grains are administered, and followed by a dose of infusion of senna, or sulphate of magnesia, or castor oil. In cases where there is reason to suspect the presence of worms in the bowels, anthelmintics should be employed in conjunction with purgatives. An infusion of spigelia, and senna may be used in such instances. The stomach, however, is often so extremely irritable in this disease, that no articles will be retained a sufficient time to operate on the bowels. Where this state exists we must endeavor, in the first place, to allay the gastric irritability, and this may, in general, be effected by minute doses of calomel and ipecacuanha; the one-sixth of a grain of the former, in union with one-fourth or one-third of a grain of the latter, has repeatedly succeeded in my hands to restrain the tendency to vomiting in this disease.

Mercury has been much recommended as a remedy in this affection. One of the only two cases of recovery from apparently completely developed arachnitis, which have occurred in my practice, appears to have been brought about by the mercurial influences. Drs. Percival, Dobson, Rush and Cheyne, mention cases which yielded to the powers of this article. Employed with a view to its constitutional influence, mercury often contributes very decisively to the reduction of visceral inflammation, and experience has shown, that in the present affection, its powers are sometimes unequivocally beneficial. The best mode, perhaps, of employing mercury in this disease, with a view to its salivant operation, is in the form of friction with the *ungt. hydrar.* In whatever way mercurials are used, it is always extremely difficult in children to procure its salivant effects. Almost the whole surface should be frequently rubbed with the mercurial ointment, where this effect is desired.

Nothing is more common in the treatment of this disease than the application of blisters to the shaven scalp; but this practice is, I conceive, of very doubtful propriety. I have always preferred placing them on the back of the neck or behind the ears, while ice or cold water is applied to the top of the head, and warm or rubefacient applications made to the feet. Dr. North, whose interesting work I have already mentioned, observes, "that blisters to the head are decidedly prejudicial in the convulsive diseases of infants;" and the same observation is applicable, I think, to the disease under consideration. The application of ice or iced water, in the manner mentioned in the last chapter, may be accounted a very useful auxiliary in the treatment of arachnitis, and to favor its revulsive influence, warm or stimulating applications to the feet may be usefully employed.

Dr. Regnault recommends, in very strong terms, the application of *moxa* in this complaint;* and its known efficacy in subduing deep-seated articular inflammation, justifies the expectation of considerable advantage from its use in arachnoid inflammation. Neither this application nor blisters, however, should be resorted to, until the activity of the circulation is reduced by general and local blood-letting. The tartar emetic ointment, also, may be very beneficially applied. (Monro.)†

Dr. Stocker,‡ of Dublin, speaks much in favor of the use of *James's powder* in hydrocephalic affections. He asserts that this preparation possesses peculiar powers to diminish the determination of the blood to the head; and of its tendency in this way, I have myself known several examples in other cephalic diseases. It may be conveniently given in small but frequent doses, in union with calomel, in this affection. Drs. Cheyne and Monro speak in equally favorable terms of this preparation in this dangerous disease. The latter states that he has cured several cases of this disease by a plaster composed of tartar emetic and wax ointment applied to the head, and the use of calomel combined with James's powder. This combination, he says, is particularly useful in restoring the healthy action of the bowels.

Dover's powder, also, has found advocates as a remedy in this disease. Drs. Brooke, Percival, Cheyne and Crampton,§ all speak favorably of its employment in hydrocephalus. After adequate depletion and purgation, in cases connected with intestinal irritation, small doses of this composition often prove serviceable, by allaying general irritability, and inducing a gentle diaphoresis. In the idiopathic form of the disease, however, opiates of every description must be carefully avoided, as their tendency to increase the flow of blood to the brain could hardly fail to prove injurious. When preternatural determination to the head depends on a remote focus of irritation—as in the mucous membrane of the bowels—opiates, by diminishing nervous excitability as well as local irritation, will occasionally reduce also the irregular determinations which depend on such irritations. It is in cases of this kind only that we may venture on the exhibition of Dover's powder, and not in these instances until the impetus of the circulation has been moderated, and the alimentary canal well evacuated.

It would seem, from the observations of Mr. Newnham, that *green tea* has a powerful tendency to lessen the morbid vascular action, not only of the system generally, but especially of the brain. "In the acute irritation of the membranes of the brain in children," he says, "the efficacy of green tea has been strongly marked in my practice. Exhibited during the early symptoms, as soon as a sufficient quantity of blood has been taken, and before effusion occurs, it has proved a more powerful means than any other we possess, of controlling the morbid action, which, if suffered to proceed to its second stage, is scarcely to be overtaken by any treatment."‖

Sect. III.—*Of Cerebritis—Softening of the Brain.*

(*Ramollissement du cerveau.*)

This form of cerebral disease has of late been particularly investigated by the French pathologists. Récamier, Bayle, Cayol, Bricheteau, Rostan, and Lallemand,¶ have published numerous and interesting observations concerning its

* Medical and Physical Journal, vol. xl. p. 16.

† [In the last stage of arachnitis I am confident that blisters over the scalp are most advantageous.—Mc.]

‡ Dublin Medical Essays, anno 1806.

§ Transact. of the Associat. of Fellows and Licentiates of the Queen's College of Physic. in Ireland, vol. vii.

‖ Med. Chir. Rev., July, 1827.

¶ Recherches Anatomies Pathologiques sur l'Encephalite. Paris, 1820.

symptoms and pathology. The disease, as it is manifested on dissection, consists of a *softening* or a kind of liquefaction of a portion of the cerebral mass, with vascular injection of the surrounding substance. Rostan divides the disease into two periods.

The symptoms of the first period are: a fixed and violent pain in the head, often continued for several months; vertigo; obtuseness of the mental faculties; confusion of the ideas; and weakness and temporary loss of memory; questions are answered after long hesitation: and the patient appears at times dejected, querulous, and wholly indifferent to surrounding objects. There is generally a sensation of tingling and numbness in the extremities of the fingers; vision is often perverted, and in some instances, total blindness occurs at times. The hearing is almost always dull, but in some cases the reverse obtains, the sense of hearing being morbidly acute. Some complain of tenderness of the epigastrium, with constipation and variable appetite. The pulse is often full and hard, and sometimes intermitting. Occasionally, there is temporary delirium, with fever and much agitation.

The second period is characterized by the gradual or sudden supervention of paralysis of *one* limb, sometimes of half the body; but consciousness and intellect remain. Questions are now answered with very great difficulty, the patient generally expressing his desires by automatic movements. In some instances a complete state of coma occurs, followed occasionally with convulsions.

In most instances, a sudden attack of convulsions is the first symptom that excites alarm. These convulsions often continue for many hours, followed, in some cases, with deep coma and a *contracted state of the flexor muscles of the limbs.* Occasionally, the paroxysms of convulsions recur repeatedly at short intervals, "the patient being sensible in the intermediate periods; and complaining of headache, till after twelve or twenty-four hours, coma supervenes. From this state there is often a complete recovery for several days, when, without any warning, the convulsions return, and end in fatal coma."

In a case which came under my care, the patient complained at times of a deep-seated pain in the head; his memory for particular names and things was greatly weakened—so much so that he forgot the name of the street he lived in; and was several times obliged to inquire the way to his own house, although but a square from it. He became taciturn, and uttered his words with a kind of hesitating doubt. He continued in this condition for five or six weeks before he was confined to his room. The pain, however, at length became very severe; the pulse was very hard and strong; the countenance flushed; and the bowels costive; but there was no delirium, and he experienced short intervals of perfect ease from the cephalic pain. After five or six days longer, double vision, great confusion of mind, and hesitancy of speech occurred, and at last deep coma, contraction of the extensor muscles of the forearms, convulsions, and death ensued.

In this instance, the membranes of the brain did not exhibit any morbid appearances, except much vascular congestion. On slicing away the superior part of the brain, it appeared to be in a perfectly natural state; on making a deeper section, however, three portions of the cerebral substance were discovered in a state of complete disorganization—being of a soft pap-like consistence, of a yellowish color, and in one place of a darkish hue, as if dissolved blood had been mixed up with the softened portions of the brain. One of these disorganized portions was in the left posterior lobe of the cerebrum, and the other two near the corpora striata and thalami opticorum.*

* [I made this post-mortem examination, and attended the patient in consultation with the late Drs. Eberle and Parrish. It is stated correctly, with the omission, however, that the cerebral substance was everywhere studded with red *puncta* under the knife, and exhibited the most decisive signs of long-continued vascular engorgement. My son and Dr. Leidy have this very day examined the body of a patient whom Dr. Bacon and I attended for some weeks before death, under nearly the same symptoms. The left side had become totally paralyzed during the last two or three days, and the ramollissement was found to be located in the right crus

The inflammatory nature of this softening of the brain has been much doubted by some. It has been supposed to be the consequence of a process similar to that which occurs in the softening of tuberculous matter in the lungs, and which, according to Laennec and some other writers, is *sui generis*, and wholly independent of inflammation. The facts and arguments adduced by Lallemand, however, render the opinion of its inflammatory character, in most instances, at least, extremely probable. The writer thinks that the *softening* is the "effect of inflammation arrested in its course by death, *before* purulent suppuration has had time to take place."

It is most probable, as Dr. Abercrombie* observes, that this affection occurs under two modifications, one unequivocally attended with cerebral inflammation, and the other a species of cerebral gangrene from defect of circulation, in consequence of a diseased state of the arteries of the brain—an opinion which, he thinks, is confirmed by the fact, that the peculiar softening of the brain mentioned by Rostan, as unconnected with symptoms indicating an inflammatory action, occurs almost exclusively in very aged individuals, inasmuch as ossification of the cerebral arteries is very common in elderly people.

"In the cases of Rostan," says Dr. Abercrombie, "the disorganization was observed chiefly in the external parts of the brain; it occurred almost entirely in very old people, few of his cases being under sixty years of age, many of them seventy, seventy-five, and eighty. It was found in connection with attacks of a paralytic or apoplectic kind; many of them protracted; and was often found combined with extravasation of blood, or surrounding old apoplectic cysts. On the contrary, the affection which I had been anxious to investigate, was found chiefly in the dense central parts of the brain, the fornix, septum lucidum, and corpus callosum, or in the cerebral matter immediately surrounding the ventricles; and occurred in persons of various ages, but chiefly in young people and in children. It took place in connection with attacks of an acute character, chiefly of the character of acute hydrocephalus; and it was in many cases distinctly combined with appearances of an inflammatory character, such as deep redness of the cerebral matter surrounding it, suppuration bordering upon it, and deposition of false membrane in the membranous parts most nearly connected with it. We may even observe in different parts of the same diseased mass, one part in the state of *ramollissement* or softening, another forming an abscess, while a third retains characters of active inflammation, and probably exhibits, as we trace it from one extremity to the other, the inflamed state passing gradually into a state of softening. This is the infection which I have endeavored to investigate, and which I consider as one of primary importance in the pathology of acute affections of the brain, and which I cannot hesitate to consider as the result of inflammation."

One of the most characteristic phenomena of *softening* of the brain, is a rigid contraction of the flexor muscles of the limbs. "Sometimes," says Lallemand, "this amounted only to simple rigidity of the limbs; at others, it was carried so far that the patient's fist was kept rigidly applied to the shoulder and the heel to the buttock;" and, contrary to what takes place in apoplexy, the mouth is drawn towards the paralyzed side. In general, the function of respiration remains entirely free from disorder, till within a few days of the fatal conclusion of the disease.

The exciting causes of this form of cerebral disease are, no doubt, very various. Aneurism of the heart appears to be capable of exciting the disease.

cerebri, and in the external portion of the adjacent thalamus opticus. The whole medullary substance of both hemispheres was of a dark or dusky hue, and studded with numerous and large bleeding puncta throughout. The pia mater was everywhere deeply loaded with blood, and the arachnoid in the fourth ventricle very much thickened and opaque. Indeed, I have never seen a case of ramollissement that did not exhibit all the signs of vascular engorgement and cerebral inflammation.—Mc]

* Pathological and Practical Researches on the Diseases of the Brain, &c. By John Abercrombie, M. D. London, 1827.

In many cases, says Lallemand, suppression of some habitual sanguineous evacuation preceded the attack of this affection; the depressing mental emotions seemed, in some instances, to have favored its occurrence; and many of the victims had been greatly addicted to the immoderate use of vinous and other fermented liquors." Dr. Johnson states that he has seen several cases which induce him to believe that "*venous* congestion of the meninges of the brain has a very considerable effect in producing softening of the brain as well as sudden death."* I have seen a case of a pap-like and yellowish-brown disorganization of an internal portion of the brain, which occurred in consequence of a severe blow received on the head six months before the supervention of the disease.

Treatment.—General and local blood-letting; sinapisms to the feet; cold applications to the head; active cathartics; blisters to the back of the neck; and calomel, with a view of its salivant operation, constitute the efficient means for combating this formidable malady. Unfortunately, however, the disease often proceeds to a state of disorganization before it becomes the object of medical attention, and then, of course, all remedial treatment must be abortive.

CHAPTER XII.

OF THE PHLEGMASIÆ OF THE RESPIRATORY ORGANS.

Sect. I.—*Pneumonia.*

The term pneumonia is employed, in a general sense, to designate acute inflammation within the cavity of the thorax, whether seated in the pleura, the mucous membrane of the bronchia, or in the proper substance of the lungs. The general characteristic symptoms of acute inflammation in the chest are:—cough, difficult and painful respiration, fixed pain in the thorax, and fever. Considerable difference occurs, however, in the character of these symptoms, as well as in the other usual concomitant phenomena, according as the one or the other of these three structures just named is the principal or exclusive seat of the inflammation. Cullen was of opinion that the pleura can never be inflamed without an extension of the inflammation to the pulmonary structure; pleuritis, according to his views, being always accompanied with more or less of peripneumonic inflammation. The observations of later pathologists,† however, have proved that the pleura is often exclusively inflamed, and that pleuritic inflammation is generally marked by symptoms sufficiently characteristic to enable us to distinguish it from acute inflammation of the proper pulmonary substance. Without doubt pleuritis is very generally attended with inflammation of the subjacent tissues; but its occasional separate existence is equally unquestionable.

Pleuritis—Pleurisy.

In *pleuritis*, a violent and pungent pain is felt in the chest, generally on one side, which is always greatly increased by a full inspiration, or on coughing. Respiration is hurried, short, and generally most oppressed when the patient lies on the affected side. The cough is short and dry, or attended with a glairy and nearly colorless sputa, and stifled as much as possible, to avoid the great increase of pain which it occasions. When the inflammation extends to the lungs, the expectoration is generally mixed with more or less of blood. The face is usually

* Medico-Chirurgical Review, December, 1822, p. 485. † Laennec.

suffused with a vivid flush; the pulse very hard, full, vigorous and frequent; the tongue covered with a thick white fur; the skin hot and dry; and the urine of a deep red color, and small in quantity. The act of respiration is performed chiefly by the action of the diaphragm and abdominal muscles, the motion of the ribs being restrained by the patient, on account of the increase of pain which it always causes.

Acute inflammation of the pleura is, however, not always attended by the foregoing unequivocal manifestations of its presence. In some instances, the disease, though rapid in its course and violent, is attended with scarcely any pain or cough. Baglivi mentions examples of this kind; and Schmidtmann has given the history of several cases of what he calls *pleuritis occulta.** M. Tacheron gives an account of a fatal case, in which there was but little pain, and *no cough*, although the pleura was found, on dissection, coated with a yellow albuminous matter, a line in thickness, and a large quantity of fluid effused into the thorax.† Bichat also refers to the circumstance of the occasional absence of pain in the chest in acute inflammation of the pleura.

Causes.—Pleuritis is most apt to attack persons of a vigorous and plethoric habit of body. The influence of cold, when the body is in a state of perspiration from active exercise or confinement in a heated room, is its most common exciting cause. Pleurisy may also arise from metastasis of other affections—particularly of rheumatism, gout, and erysipelas; and it has been known to occur in consequence of suppression of the catamenial and hemorrhoidal discharges.

Pleurisy from translated rheumatism or gout, is by no means an uncommon occurrence. I have met with a considerable number of cases of this kind, and one recently which was a strongly-marked instance. The patient was affected for several weeks with severe rheumatic inflammation of the left elbow-joint. A cold poultice was applied to the joint in the evening, and on the next morning the pain and redness had in a great measure subsided. In the afternoon, a severe pain came on in the left side of the thorax, which rapidly increased in violence, and soon exhibited all the characteristic phenomena of pleurisy, whilst the pain in the elbow disappeared entirely. It was successfully treated with blood-letting, blisters, and the internal use of calomel and opium. In a few weeks after recovering from this attack, subacute rheumatic inflammation occurred in the elbow of the *right* side.‡

Pleurisy and depôts of pus in the lungs are sometimes rapidly developed after capital surgical operations. M. Velpeau, in a very interesting memoir, has given the following as the result of his observations on this subject: 1. "Those who die of acute diseases succeeding surgical operations or profuse suppurations, generally fall victims to pleurisy, and the formation of abscesses more or less numerous in the lungs. 2. That the kind of pleurisy, hitherto undescribed, is of a peculiar nature, and might be denominated the pleurisy succeeding surgical operations. 3. That this disease differs from simple pleurisy in the latency of its progress, the rapidity of its course, and the almost invariable certainty of its fatality. 4. That the pleurisy and formation of depôts of matter are rarely accompanied by characteristic local symptoms sufficient to give notice of their existence." M. Velpeau ascribes these secondary pneumonic affections to the absorption of pus, and its passage into the current of the circulation.§

Post-mortem appearances.—On dissection, the pleura is generally found uniformly red, or punctuated with small red specks of irregular shape and very close together. Laennec states that these red points "occupy the whole thickness of the pleura, leaving small intermediate spaces retaining the natural white color."

* Summa Obs. Med., vol. i. p. 108.

† Recherches Anatomies Pathologiques, &c.—Vide Med.-Chir. Rev., March, 1824.

‡ For much interesting information concerning *rheumatic pneumonia*, the reader is referred to Stoll's Ratio Medendi, &c., part i. p. 82, and to Schmidtmann's Summa Observ. Medicarum, tom. i. p. 62, et seq.

§ Revue Médicale, December, 1826.

The pleura is not often found thickened in consequence of inflammation. Extravasation on the inner surface of this membrane is a never-failing occurrence in fatal cases of this disease. Laennec thinks that this extravasation commences with the inflammation. The matter thus thrown out by the vessels of the inflamed pleura, consists of a *semi-concrete* or pseudo-membranous substance, or of coagulable lymph, or of sero-purulent fluid effused into the cavity of the chest. This fluid generally contains small flocculi or filaments of coagulable lymph, or of concrete pus, and is either of a light yellow color and nearly transparent, or reddish, as if a small portion of blood were mixed with it. Adhesions between the costal and pulmonary portions of the pleura occur in nearly all instances through the intervention of false membranous substances.*

Prognosis.—Acute pleuritis is not, in general, a very dangerous affection in subjects of a good and vigorous constitution. There is no inflammatory affection which is more under the control of an active antiphlogistic treatment. In subjects, however, of a weak habit of body—and especially in such as are predisposed to phthisis pulmonalis—pleurisy, if not a disease of much immediate danger, is to be dreaded on account of its tendency to develop pulmonary consumption. When the inflammation extends to the substance of the lungs, the patient may sink at an early period from effusion into, or disorganization of its structure. The following circumstances may be regarded as indicative of imminent danger in this affection. A frequent effort to sit up, particularly when there is a wheezing sound in the trachea, bloody expectoration,† and an obstructed pulse. The supervention of diarrhœa is a most unfavorable sign; convulsions and coma are no less ominous of a fatal tendency. Schmidtmann asserts, that he has never known an instance of recovery from this disease, after convulsions and coma had supervened.

Pneumonia.—Inflammation of the Lungs.

When the parenchymatous substance of the lungs is the principal or sole seat of the inflammation, the disease is designated by the term *peripneumony*. In this variety of thoracic inflammation, the breathing is much oppressed, particularly when the patient is in a horizontal posture; an *obtuse* pain is felt in the chest, generally in the region of the sternum, sometimes in the epigastrium, and occasionally in the side or scapular region. The cough is attended with a copious viscid expectoration, mixed more or less with blood. The skin is hot and dry; the urine high colored and scanty; and the pulse frequent, full, obstructed, laboring, but rarely very hard; but in the advanced stage of the disease, it usually becomes weak, soft, obstructed and irregular. In violent cases, tending to effusion or disorganization of the inflamed portion of the lungs, the countenance acquires a livid aspect, and the veins of the neck become turgid. The patient generally lies on the affected side, although, in some instances, the reverse posi-

* The false membranes produced in pleurisy generally change after some time into a kind of cellular tissue, "or rather into a true serous membrane, like that of the pleura. This change," says Laennec, "is produced in the following manner: the serous effusion which accompanied the membranous exudation is absorbed; the compressed lung expands, and the false membrane investing it and the costal pleura become united in one substance. By degrees, this substance becomes divided into layers pretty thick and opaque, which are separated by a very small portion of serosity. About this time the blood-vessels begin to make their appearance in it, the first rudiments of which have the aspect of irregular lines of blood, much larger than the vessels which are to take their place. After a time the pseudo-membranous layers become thinner and less opaque; the lines of blood assume a cylindrical shape, and ramify in the manner of blood-vessels. Eventually the layers of the false membrane become quite transparent, and nearly as thin as those of the ordinary cellular tissue. By degrees, it acquires the firmness of the natural cellular substance, and becomes the bond of a firm union between the lungs and the costal pleura."

† Baglivi says, "Erectum sedere velle in morbis acutis pulmonum perniciosum ac ferme lethale, præsertim, si adsit sibillus in aspera arteria, et difficultas excreandi sputi, et licit cum talibus signis pulsum bonum videris, noli credere, nos fallit."—*Opera Omnia*, p. 42.

tion is preferred. "The sputa are white, slightly yellowish or greenish, somewhat diaphanous, and intermixed with bubbles of air. The tenacity of the matter expectorated is so great, that we may often reverse the vessel which contains it, and retain it in this position for a time without detaching it from its sides." Laennec regards this kind of sputa as pathognomonic of this affection, "since it is the only one," he says, "that is found exclusively in it."

In this, as in the former variety of pneumonic inflammation, the symptoms are sometimes so inconspicuous and equivocal in their character, that the true nature of the disease may remain doubtful, or be entirely mistaken, until fatal disorganization has occurred in the pulmonary structure. An instance of rapid fatal pneumonia is reported by Dr. Damiron, one of the physicians of the Hospital *Val de Grace*, in which no pain whatever was complained of by the patient, nor did epigastric pressure produce any uneasiness. The breathing was difficult, the cough frequent, the expectoration ropy and copious. On dissection, three-fourths of the right lung was hepatized, and the left lung was black and crepitous.* M. Andral has related seventeen cases, in which one or more of the characteristic signs of the disease were absent. In several instances, there was neither pain nor cough.†

Pneumonia Biliosa.—Bilious Pleurisy.

There is a modification of pneumonia, which, from the prominent symptoms of hepatic disorder which it exhibits along with the ordinary phenomena of pneumonic inflammation, has been termed *bilious pneumonia*. This variety of the disease occurs during cold and variable seasons, in districts abounding in sources of miasmatic exhalations. It appears to be the result of the combined agency of *koino-miasmata* and atmospheric vicissitudes. The initial symptoms of this modification of the disease differ very little from those which usually usher in an attack of ordinary bilious remittent fever. In some instances, a sense of fullness and tension is experienced in the right hypochondrium, a few days previous to the supervention of the disease, and occasionally dysenteric symptoms occur before the fever commences. In almost all cases, considerable pain is felt in the back and extremities during the premonitory period. The skin from the beginning is more or less tinged with bile, and the conjunctiva, especially, is often conspicuously icterode. The face is flushed, "and a sickly mixture of red and yellow, upon close examination, betrays the existence of a disturbed state of the liver." (Potter.) Acute pain in the forehead is almost constantly present. The pain in the chest is sometimes extremely severe and pungent; but more commonly it is obtuse, and attended with a sense of weight or oppression in the breast. In some cases the fever continues for several days before the pectoral pain supervenes. The expectoration is not very copious—the sputa being of a frothy yellowish appearance, marked frequently with streaks of blood. The fever is generally attended with manifest evening exacerbations and morning remissions. When vomiting takes place, an occurrence very common in this affection, more or less of bilious matter is generally thrown up, although, in some instances, the secretion of bile appears to be entirely suspended; the ejections consisting of nothing else than gastric mucus and the ingesta. The tongue is at first white, with a yellowish streak along the middle, which, as the disease advances, becomes dark-brown and dry. The urine is always of a deep yellow or bilious color; and the pulse is generally small, frequent and quick, with a slight degree of preternatural tension.

Post-mortem appearances.—The morbid structural changes produced in the lungs by inflammation are:

* Med.-Chir. Rev., October, 1825.

† Clinique Médicale, &c. Par G. Andral. Paris, 1824.

1. *Engorgement*, the inflamed portion of the lungs exhibiting externally a brown mottled or violet color, "which forms a strong contrast with the gray or pale rose-color of the healthy part." It is of a firmer texture, and heavier than in the sound state—feels crepitous under the finger, though less so than in the healthy condition; and on being pressed between the fingers, the air-cells will be perceived to contain a considerable portion of extravasated fluid. When the engorged portions of the lungs are laid open with the knife, a large quantity of a frothy reddish serosity runs out, and the internal structure exhibits a livid and red appearance. If portions of the engorged lung are pressed until all the fluid has been squeezed out, they become as elastic and crepitous, and of the same color, as the healthy part, if air be blown into them. Simple engorgement appears to be the result of the weakest grade of acute inflammation, and may even arise mechanically from mere sanguineous congestion during the last moments of life, or in articulo mortis. (Andral.) When the inflammation is intense, and terminates in the above engorged condition, the structure of the lungs is at the same time rendered soft or friable, being readily broken down when pressed between the fingers. To distinguish mere engorgement by extravasated fluid from sanguineous congestion and engorgement from inflammation, we must judge less, says Andral, from the color than the degree of firmness of the pulmonary structure. In almost every instance arising from inflammation, the substance of the lungs is rendered more or less friable.

2. *Hepatization*, presenting at first sight the appearance and consistence of liver. In this variety of structural change, the lung is impermeable by air, and is entirely deprived of its crepitous feel under the finger, and sinks when put into water. When cut into, a small portion of a reddish fluid issues, without exhibiting any frothy appearance. If we examine the incised surface with a lens, we perceive that the lung has lost its cellular structure—the pulmonary substance exhibiting a red granulated appearance; and on being pressed between the fingers, is found to be readily broken down and reduced to a reddish pulp. (Andral.) When a lung is hepatized, its volume seems much greater than natural, "but this apparent enlargement is caused merely by the diseased lung not collapsing." This morbid condition has been called *red* hepatization.

3. *Gray hepatization.*—This seems to be the result of a more intense degree of inflammation than that which gives rise to *red hepatization*. In the present morbid condition, the pulmonary structure is granular, condensed, and impermeable to air, as in the preceding variety; but its color is *grayish or yellowish pale*, and when cut into, discharges copiously an opaque-yellowish or grayish fluid, which is manifestly purulent, and almost entirely without smell. In some cases, the pus does not issue spontaneously from the incised surfaces, but on pressing the tissue moderately, small drops of purulent fluid are forced out. In this variety of disorganization, the pulmonary tissue is softened, and readily converted into a grayish pulp by pressure between the fingers. *Acute* inflammation of the lungs never terminates in *induration* of its structure; this termination is peculiar to *chronic* pulmonary inflammation. According to Andral, there are two varieties of induration, the *red* and *gray*.

4. *Gangrene.*—This is a very rare termination of acute inflammation of the lungs. Andral gives an account of two instances of this kind. In a late number of the *Journal Hebdomadaire*, there are several cases reported, which terminated in gangrene of the pulmonary structure. These cases were attended with an intolerable fetid and gangrenous breath, particularly during the fits of coughing, and the matter expectorated was of a chocolate color, and emitted a most offensive smell. On dissection, a considerable portion of the lung was found converted into a putrid mass, containing fragments of pulmonary texture, of a black or violet color. The surrounding portions of lungs were infiltrated and partly hepatized. Dr. Chambers, also, has published some cases of gangrenous suppuration of the lungs, in which he refers particularly to the intolerable fetor of the breath as a diagnostic sign of this mode of termination. Andral

states, that at first the expectoration is a greenish liquid, then dirty gray, at times reddish, and exhaling an extremely fetid smell.*

The formation of *abscess* from pneumonic inflammation is also a very rare occurrence. Both Laennec and Andral assert, that pulmonary abscess is among the most uncommon terminations of acute inflammation of the lungs. The former met with but four or five instances in several hundred cases which he examined; and the latter writer states that he has met with one case only.

Laennec observes, that "nothing is more uncommon than to find the inflammation confined to the superior lobes of the lung." This, however, is contradicted by the observations of Andral, who, in 88 cases, found 47 with inflammation of the inferior lobe, 30 of the superior lobe, and 11 instances in which the whole lung was affected.

Diagnosis.—The most important diagnostic signs between pleurisy and peripneumony are those obtained by percussion of the chest, and by pressure made on the abdomen. In peripneumony, percussion made with the extremities of the fingers brought together in a line, produces an *obscure* dull sound, which is best estimated by comparing it with the sound produced by percussion of the healthy side of the chest. In pleurisy, on the contrary, no difference can be perceived in the sound produced by percussion of the two sides of the thorax. In peripneumony, firm pressure on the abdomen with both hands, so as to push up the diaphragm against the lungs, almost invariably excites cough, great oppression, and a sense of suffocation; whereas in pleurisy no such effects result from abdominal pressure. "If, then, we find united in the same patient a clear sound of the painful side on percussion, insensibility to abdominal pressure, smallness and rapidity of the respiration, an increase of pain on full inspiration, particular uneasiness upon lying on the affected side;† and, lastly, pain upon firm pressure of the intercostal spaces of the affected side, we have little reason to doubt of the existence of pleuritic inflammation." (Roux.)

Peripneumony is characterized by an obscure pain in the chest; great efforts at inspiration, in order to supply the suspended functions on one part of the lungs; increased suffering on firm abdominal pressure, and a dull obscure sound on percussion of the chest. Difficulty of lying on the *sound* side is generally mentioned among the characteristic symptoms of peripneumony; but Andral asserts that this observation is by no means generally correct. The most common position is on the back.

Auscultation, or the employment of the *stethoscope*, has of late years attracted much attention as a means for obtaining a correct diagnosis in pectoral diseases. Interesting information with respect to the particular condition of thoracic affections is no doubt to be obtained from this mode of examination; but it requires much careful experience before a sufficient *tact* is acquired to procure satisfactory information in this way. M. Andral, who has paid much attention to this subject, has given the following account of his experience in *auscultation* in pneumonic inflammation.

"No sooner does the pain and difficulty of breathing come on, than the ear, applied to the thoracic parietes, recognizes a notable modification in the nature of the noise heard at each inspiration, and as the inflammation advances, the noise undergoes fresh modifications, which indicate, with more or less precision, the situation and degree of the affection. The voice is also modified.

"At the commencement of the disease, whilst the lung is in the state of *simple* inflammatory engorgement, the noise of respiration in the affected part

* Schmidtmann, in an account of a case of pneumonia which terminated in gangrene of the lungs, says, "impar sputes saniosis, fuscis, nigris, *putentibusque* reddendis."—*Sum. Ob. Med.*, vol. i. p. 80.

Cases of gangrene of the lungs are also reported by MM. Martinet and Récamier in their Hospital Reports.—See *Revue Médicale*, for 1827.

† This arises from the lungs pressing on the inflamed pleura when the patient lies on the affected side.

loses its clearness, and is more or less mixed with the *dry-rattle*, which Laennec terms crepitous, from the resemblance it bears to the noise emitted by common salt when thrown upon hot coals. It also bears considerable resemblance to the peculiar noise occasioned by folding or doubling a piece of parchment. The noise of natural respiration is always altered and obscured by this *rattle*, but is not always entirely masked or concealed by it. As the inflammation increases, the rattle becomes more and more manifest, until at length it entirely conceals the inspiratory murmur. The presence of crepitous rattle indicates engorgement, or the first stage of inflammation; and so long as it continues, it shows that the inflammation (in a great part at least) has not advanced beyond the first degree. From its greater or less intensity, and from its more or less strong admixture with the natural respiration, we may derive indications of the degree to which the engorgement extends, and whether it is passing into the state of hepatization or otherwise. Whilst the noise of natural respiration predominates over the crepitous rattle, we may conclude that the inflammation is slight; but if the rattle increases, and predominates in its turn, until at length it completely masks the respiration, we may be certain that the inflammation is advancing, and that it is passing on to the second degree.

"At a more advanced period, the crepitous rattle gradually ceases to be heard; and if the natural respiration then returns, we know the disease is subsiding; but if there be no respiratory murmur audible, or if the natural respiration is replaced by *another kind*, hereafter to be described, we may be certain that the disease is becoming more serious, and that the lung is hepatized.

"M. Laennec has established the fact, that in many cases when engorgement of the lungs is succeeded by hepatization, the ear applied to the chest *feels* the motion of the thoracic parietes, but does not *hear* any respiratory noise, either natural or pathologic. We have often verified this statement; but we have also frequently observed, in the same stage of the disease, another very remarkable phenomenon, which appears to have escaped Laennec's attention. In certain cases, where the lung is in the state of red or gray hepatization, the noise of respiration does not disappear, but is *modified* in a singular manner, and is evidently different from the natural kind. It seems as if a person placed near the auscultator's ear breathed forcibly through a brazen tube; there is at the same time a peculiar kind of *resonance* of the voice wherever this kind of respiration is audible. The modification of the voice is not properly either *egophony* or *pectoriloquism;* it approaches more nearly to that form of resonance which is observed in dilatation of the bronchia. Whenever cases presenting this double modification of the voice and respiration have proved fatal, dissection has constantly presented either red or gray hepatization, or pleuritic effusion.

"The explanation of this modification of the voice and respiration seems easy. It appears to us to depend upon the air not being able to penetrate farther than the large bronchial tubes; and, for this reason, the phenomena are manifested not only in pulmonary hepatization, but also where the lung is compressed by pleuritic effusion: and, in short, wherever the air is prevented reaching the air-cells of the lungs.

"Whilst auscultation of the diseased side affords the different signs already enumerated, the respiration of the healthy side is heard with much greater intensity than in the physiological state;—as if it were necessary for the *healthy* lung to receive a greater quantity of air in a given time, in order to supply the deficiency of the diseased one.

"When the inflammation occupies a circumscribed portion situated at a distance from the surface of the lung, more especially a part of the base of the centre or of the root, auscultation teaches us nothing concerning the seat or degree of the disease."*

Prognosis.—A copious expectoration of a thick uniform yellowish matter is

* Med.-Chir. Rev., October, 1826, p. 514.

one of the first, and perhaps most encouraging indications of a favorable turn of the disease. When this symptom occurs in connection with an increased flow of sedimentous urine, and gentle diaphoresis, we have good grounds for predicting a favorable issue of the disease, more especially, if at the same time the oppression and pain in the chest abate, and the cough is less troublesome. When, on the contrary, the pain and oppression become more generally diffused throughout the thorax; when the cough is dry, or attended with dark or red liquid sputa; when, along with a sense of suffocation and great anxiety, the countenance and lips become livid, and the pulse soft, irregular, and laboring; and, finally, when delirium, coma, or convulsions supervene, or a sense of coldness is felt in the interior of the body, whilst the surface is very warm, the danger is to be considered as very great. A rattling respiration, accompanied with lividity of the countenance, and a constant effort by the patient, to bare the breast and to raise his head and shoulders from the bed, are almost certainly fatal indications.* The supervention of diarrhœa, in this disease, is a very unfavorable circumstance.† The prognosis in pneumonia is nevertheless attended with considerable uncertainty. Instances of unexpected recovery occur, after the most dangerous symptoms have made their appearance; and, on the other hand, death sometimes speedily supervenes, in cases apparently free from particular danger.‡

Treatment.—Both in pleuritic and peripneumonic inflammation, *bleeding* is the first and most important remedial means. The extent to which it is to be carried must be entirely regulated by the degree and obstinacy of the pain, and the state of the pulse. In pleurisy, we are generally obliged to abstract more blood than in peripneumonia, before the arterial reaction is sufficiently moderated. Whether the pleura or the proper substance of the lungs be the seat of the inflammation, however, a sufficient quantity of blood should be drawn at once, to make a very manifest impression on the pulse. The blood should be suffered to flow without any regard to mere quantity, until a diminution of the pain and oppression in the chest, as well as of the action of the pulse, ensues. If the action of the pulse and the pain increase again, more blood must be drawn, and again to the extent of producing a decided impression on the system. *The blood should be drawn in a full stream from a large orifice.* In *pleurisy* it is sometimes necessary to repeat the venesection three or four times in the course of the first twenty-four hours, before the violence of the disease is broken down. More caution, however, is necessary in the employment of the lancet in *peripneumonic* inflammation. Here, although prompt and very efficient blood-letting is decidedly beneficial, and without the least risk in the *commencement* of the disease, yet it is necessary to proceed with caution in the repetition of this measure, as the disease advances, lest dangerous prostration be induced. In violent attacks of peripneumony, the pulse is sometimes small, frequent, oppressed, and but slightly tense from the beginning of the disease. This state of the pulse may be owing to an oppressed or congested condition of the heart and large internal venous trunks; but it depends, also, occasionally, on an impaired state of the vital powers, particularly in what has been called nervous or typhoid pneumonia. In such cases a vein should be opened; and if the pulse rises while the blood is flowing, we may proceed with confidence in the further abstraction of blood. Should the pulse become still weaker, however, the bleeding must be immediately stopped. Richter observes, that where the pulse is small in the commencement of peripneumonia, the physician should place his fingers on the artery, and request the patient to make two or three strong inspirations, or to excite him to cough, by causing him to inhale the fumes of vinegar. If, by these

* Richter, Specielle Thérapie, band. i., p. 415. Baglivi, Opera, p. 42.

† Baglivi, Opera, p. 35. Riverius, Praxis Medica, t. i. p. 72.

‡ "Plus una vice vidi læta morbi facie, et ægroto atque adstandibus sibi gratulantibus, ex pneumonia subito mortem accidisse. At non raro etiam contrarium observavi: rebus ferme conclamatis et ægroto ad stygis confinia positio, prudenti atque audaci medicatione cum e manibus libitinæ evacisse."—*Schmidtmann, Ob. Med.*, t. i. p. 25.

exertions, the pulse becomes fuller and more active, we may be assured, he says, that there is still sufficient energy in the heart and arteries to justify the abstraction of blood.* The blood drawn in these affections exhibits a thick, sizy, or buffy coat, on the surface of a more or less *cupped* coagulum; and so long as the blood exhibits this appearance, bleeding may be regarded as a proper measure. The disappearance of the buffy coat is not, however, to be considered as a certain indication that blood-letting is no longer proper; for where the action of the pulse and the degree of pain in the chest are such as to indicate the propriety of further abstractions of blood, bleeding may be confidently employed, notwithstanding the absence of the buffy coat on the drawn blood. "Some practitioners," says Dr. Millar, "have directed blood to be drawn, till the sizy crust which generally covers its surface, disappears. But this rule is extremely equivocal: in some, the blood puts on this appearance at the beginning; in others, not till towards the decline of the disease, and sometimes no crust is observed through the whole course of the disease. The only certain indication, therefore, arises from the mitigation or violence of the symptoms." Local bleeding by *leeches* seldom procures any particular advantages in the early periods of these affections, beyond that which arises from its general depleting effects. After the disease has been in a great measure subdued, and venesection is no longer indicated, leeching may no doubt be occasionally beneficial. In this case, small and repeated doses of digitalis, also, sometimes contribute materially to the further reduction of the general and local inflammatory action. A half a grain, in union with six or eight grains of nitre, may be given every three hours, until its effects on the pulse or stomach are manifested.

Although gentle aperients are decidedly beneficial in pneumonic inflammation, yet general experience goes to show that active and repeated purging is much more apt to prove prejudicial than useful. This is more particularly apt to be the case after free expectoration has been established. Before the complete establishment of the expectoration, Dr. Johnson states that he has known purgatives very beneficial in common pulmonic inflammation. Dr. O'Halloran also employed active purges with advantage in pneumonia, among the British troops at Gibraltar. (*Med. Repos.*, No. 8.) Nevertheless, as a general rule, active catharsis may be regarded as improper, unless, perhaps, in the very commencement of the disease. Small doses of one of the purgative neutral salts, or of castor oil, may be given, from time to time, so as to keep up a regular but moderate action of the bowels; or laxative enemata may be used with advantage for this purpose.

Emetics are equally improper in pleurisy and in peripneumony; but in *bilious pneumonia*, they may be accounted as among our most useful curative means. Richter states, that in this variety of the disease, emetics will often remove the pain in the chest as by a charm; and Stoll makes the same observation. (*Ration. Meden.*, t. i.) In the few cases of this modification of pneumonia in which I have prescribed, I have had the most satisfactory evidence of the utility of emetics in its treatment. They generally bring on a uniform diaphoresis, promote expectoration, and allay the pain in the thorax, often almost immediately. They usually bring up an abundance of bilious fluid from the stomach.

Cooling diaphoretics are very useful auxiliary remedies in these affections.—Nitrate of potash with minute portions of antimony, the pulvis antimonialis, and the *muriate of ammonia*, are the best articles of this kind in the present diseases. Richter particularly recommends the last-mentioned article in the treament of inflammatory pectoral affections; and my own experience coincides entirely with his observations concerning its usefulness. It may be given according to the formula mentioned under the head of *intermitting fever*.

With a view both of diminishing the action of the heart and arteries, and of promoting expectoration, *nauseating* doses of tartar emetic are generally highly useful. In Italy, large doses of this article are almost exclusively relied on in

* Specielle Thérapie, band. i. p. 418.

the treatment of pneumonic inflammation. Rasori and his followers make this the principal, and, in some instances, almost the sole remedy. They exhibit it to the extent of from a scruple to several drachms in twenty-four hours; and they assert that when given thus freely, it seldom excites either vomiting or strong purging, but always a most decided sedative or contra-stimulant impression on the sanguiferous system. M. Laennec speaks strongly in favor of large doses of this antimonial in acute pulmonary affections. He asserts, that in cases treated solely by bleeding, the pulmonary engorgement, discoverable by the *stethoscope*, continues much longer than in cases that are treated with large doses of tartar emetic. He thinks that, given to the extent of from twelve to twenty grains during the day, this article acts specifically in subduing inflammation, and powerfully promotes absorption.* Dr. Fontaneilles, of Milan,† whose experience confirms the observations of Rasori on this subject, observes, that the power to sustain large doses of tartar emetic, depends wholly on the system being in a morbid condition; for in a healthy state, or after the disease is removed, the ability of taking large doses of this medicine without injurious consequences, does not exist. It would seem, moreover, that the power of bearing large doses of antimony in peripneumony, varies in the different stages of the disease. It is greatest at the acme of the disease—being less prominent in the beginning and in the decline of the inflammation. Dr. Fontaneilles generally gives about twelve grains per day in the first stage of the inflammation; but after the disease has advanced to its acme, from a scruple to half a drachm is administered in the same period. If the medicine produce active vomiting, the dose must be diminished; but so long as the power of bearing it without great nausea or vomiting continues, the dose should not be lessened, although the symptoms of the disease may be declining.

Many practitioners have strongly recommended the employment of *calomel* and *opium* in peripneumonic inflammation; and my own experience has furnished me with repeated examples of the utility of this practice.‡ After the disease has continued for three or four days, and the action of the heart and arteries has been duly moderated by depletion, opium often does much good by allaying the pain and cough, and powerfully promoting a salutary expectoration. There is nothing to be apprehended from its stimulating effects. When given in combination with minute doses of tartar emetic, or with calomel, after adequate abstractions of blood, this article has a more decided tendency to increase the expectoration and complete the resolution of the disease, than perhaps any other internal remedy we possess. When the pain and cough continue to be troublesome after venesection has been efficiently practised, a grain of opium in union with two grains of calomel, given every three or four hours, will seldom fail to bring great and permanent relief. Where, however, the expectoration is free, and of a proper consistence, opium, if it be at all used, should be given in much smaller doses. One-fourth of a grain of this narcotic, with one-tenth of a grain of tartar emetic, or two or three grains of pulv. Doveri, may, under such circumstances, be given every four or five hours. In pneumonic inflammation from metastasis of rheumatism or gout, this article is especially beneficial. In such cases it ought to be given in large and frequent doses—two grains with the same quantity of calomel every two or three hours, until the system is completely under its influence. Richter states, that when pneumonia is the conse-

* Revue Médicale, Mai, 1824.—Hospital Reports from La Charité.

† Archives Générales, February, 1824.

‡ "Methodi Hamiltonianæ commendatio ab illustri Sam. Gottl. Vogel (*a*), cujus auctoritatem tanti semper feci, me movit eam tentare; et tentando edoctus sum ejus inventum et vulgationem magnum praxeos medicæ esse incrementum. Prima pericula omnem longe superabant expectationem meam; quare viginti abhinc annis et ultra non facile morbus inflammatorios mihi obvenit—et multi centeni mihi obvenere—cui *opium* et *calomel* faustissimo cum successu non opposuissem."—*Schmidtmann, Sum. Obser. Medicar.*, t. i. p. 27.

(*a*) Handbuch der Pract. Arzneywissenshaft, 4 ter. theil. s. 25, u. 231.

quence of repelled cutaneous eruptions, of measles, scarlatina, or of irregular gout, *camphor*, given in combination with ipecacuanha and opium, is, in general, a highly useful remedy. After blood has been decisively abstracted, one grain of camphor in union with the same quantity of opium and two grains of *ipecacuanha*, will often, he says, remove the pain and cough as by enchantment. If the pain returns, the dose must be repeated.

Expectorants may be employed with advantage after the violence of the inflammation has been reduced by blood-letting; but the benefit to be derived from this class of remedies is, upon the whole, much less considerable than might be inferred from the known salutary influence of a free expectoration in this affection. In the early or active stage of the disease, all articles of this kind, with the exception of tartar emetic, *kermes mineral*,* or mucilaginous fluids, are liable to do mischief. When the violence of the disease has been moderated, and the inflammation is about terminating in resolution, opium with tartar emetic, as has just been mentioned, will, in general, assist materially in establishing the expectoration. An infusion of the *rad. polygal.*, sweetened with honey, may be beneficially given during convalescence from pneumonic inflammation. The patient should be allowed the free use of demulcent drinks—such as barley-water, flaxseed-tea, or a solution of gum Arabic, to which honey or currant jelly may be added.

Blisters are among our most valuable means for subduing pneumonic diseases. As soon as the firmness and activity of the pulse have been reduced, a large vesicatory should be applied over the region of the affected part. Baglivi observes, that in some instances of pleurisy, great difficulty of breathing and suppression of the expectoration occur about the fifth or sixth day. In such cases, two blisters, he says, applied to the inside of the thighs, will generally produce a favorable change in all the symptoms. Triller recommends the same practice.†

In protracted cases of pleuritic inflammation, where symptoms of effusion are present, a combination of calomel, digitalis, and squills, has been found particularly serviceable.‡ I have found the diuretic mentioned under the head of chronic peritonitis, very useful under circumstances of this kind. (See p. 199.)

In cases that terminate in empyema, *paracentesis thoracis* is recommended; and we are not without a considerable number of examples of the successful performance of this operation, both in empyema and vomica. Dr. Samuel Colhoun, in his edition of Gregory's *Practice of Medicine*, states, that "he has known a case in which this operation had the happiest effect, though the opening into the cavity of the abscess was deep, and penetrated far into the lungs."§

* R.—Kermes mineral grs. xv.
Extract. glycyrrh. ℥ij.
Aq. fontanæ ℥vij.
Syrup. scillæ ℥iij.—M. S. Take a tablespoonful every two hours.

† De Pleuritide, p. 48.

‡ R.—Calomel ℈i.
Pulv. scillæ ℈iij.
—— digitalis ℈i.
Conserv. rosar. q. s.—M. Divide into twenty pills. S. Take one three times daily.

§ [Dr. Colhoun alluded to an operation which I performed many years ago in his presence. The discharge was in that case decidedly purulent, consisting of more than 30 ounces of pure globular pus. As it was not like the serous contents of a distended pleura, we concluded that the case was one of interstitial pulmonary abscess; and that it militated against Laennec's idea that such collections are always pleural. There was also much substance of a fleshy kind to penetrate with the trocar on the inner surface of the ribs, which induced Dr. Colhoun to conclude that I penetrated "far into the lungs." I have repeatedly performed the same operation since and evacuated pleuritic effusions after cutting through a very thick false membrane behind the intercostal space, which gave the same sensation as my cutting into the substance of the lungs. The operation of paracentesis after pleurisy has now become very common, and if performed before the lung has become greatly shrunken, is generally successful. At all events, it enables the subsequent applications of blisters and mercurials to excite the reabsorption of false membranes on the pleura, and thus prevent a return of the effusion.—Mc.]

For similar instances of successful *paracentesis thoracis*, the reader is referred to the works of Werlhoff,* Donald Monroe, Stoll,† Richter,‡ Hoffman,§ B. Bell, and Aug. Gott. Richter.‖ M. Jowett has reported a very interesting case of empyema successfully treated by this operation;¶ and we might go on to cite many more instances of this kind. I have been thus particular in referring to authorities in favor of this operation in cases of empyema or thoracic effusion, from the equivocal manner in which it is spoken of by Dr. Gregory in his practice. "*Paracentesis thoracis*," he says, "is *probably* advisable in *certain* cases both of vomica and empyema; but the observations of authors on this piece of practice are very scanty."**

When there is reason to believe that hepatization of a portion of the lungs has taken place, benefit may still be obtained, in some instances, from external irritating applications. Frictions with tartar emetic ointment, or with an ointment made by mixing two drachms of the white precipitate with an ounce and a half of lard, will answer well for this purpose. Setons, and caustic issues, also, are useful in cases of this kind; or continued blistering with *emplast. lyttæ*. Internally, advantage may probably be derived from small doses of muriate of mercury in union with conium or belladonna. One-tenth of a grain of this mercurial, with from two to three grains of the extract of conium, may be given three times daily. Diuretics, also, have been recommended both in hepatization and in suppuration of the pulmonary tissue—more especially in thoracic effusion. When suppuration has occurred, the strength of the system should be supported by digestible and nutritious diet, opium, or extract of conium—but the more diffusible stimulants must be avoided.

Sect. II.—*Cynanche Laryngea.—Laryngitis.*

Until within a comparatively recent period, *laryngitis* was generally confounded with croup, to which, indeed, it bears a considerable resemblance. Boerhaave refers to this disease in section 802 of his aphorisms, and Van Swieten quotes a strongly-marked case from Tulpius.†† More recently, Drs. Farr, E. Percival and Home,‡‡ have published interesting papers on the pathology and treatment of this severe and dangerous variety of cynanche; and the chapter on

* Opera Hanov., 1775, p. 775.

† Ratio Medendi, vol. iii. p. 155.

‡ Chirurgische Bibliothek, band. 3, s. 464. Band. 4, s. 476; Band. 6, s. 590; Band. 7, s. 311; Band. 8, s. 728.

§ Unterricht von dem Collegium der Aertze in Munster.

‖ Medico-Chirurg. Observations.

¶ Med.-Chir. Rev., July 1826. M. Jowett observes, "I have twice very recently had occasion to resort to paracentesis of the thorax, in hopeless cases of effusion arising from pleurisy. In both instances, the operation was the means of prolonging, although it did not eventually save, the lives of the individuals."

To prevent the admission of air into the cavity, M. Jowett recommends the operation to be performed in the following manner: "Having made a small incision through the integuments only, in the place selected for the operation—which will most commonly be in the back, in the sixth or seventh intercostal space—thrust a *small* trocar carefully through the muscles and costal pleura; having withdrawn the trocar and left the canula in the wound, join a tube, connected with a Reid or Weiss' syringe to the canula, and slowly abstract the fluid by the syringe, continuing to work it as long as the piston moves freely, or until symptoms come on which render it necessary to desist. Then remove the canula from the wound without previously separating it from the syringe; approximate the edges of the integuments by plasters, and apply a compress to make it more secure."

** "The history of the operation of paracentesis thoracis for *empyema* or hydrothorax, would well deserve an article in a periodical journal. Kurt Sprengel has given a most erudite history of this operation, from the days of Hippocrates to the close of the last century, occupying eighty-seven pages of letterpress."—*Dr. Johnson's Med.-Chir. Rev.*, vol. v. p. 273.

†† Observ. Medicar., lib. i. cap. 57, p. 96.

‡‡ Medico-Chirurg. Transact., vol iii. p. 268.

this subject in Dr. Armstrong's work on typhus, may be advantageously consulted.

The disease usually commences with the ordinary initial symptoms of inflammatory fever; the patient experiencing at first slight sensations of chilliness alternating with flushes of heat. A feeling of soreness in the fauces, attended with more or less tenderness to pressure in the larynx, and uneasiness in swallowing, are among the first symptoms. The voice soon becomes changed into a thick, slightly hoarse whisper, and on strong inspiration, the air seems to enter impededly, as if it were forced through a very narrow aperture, and is attended with a hoarse, dull, hollow sound. On examining the fauces, they exhibit a pale red, tumefied, and œdematous appearance. The expectoration is not abundant, and consists almost wholly of saliva of a ropy character. The pulse is generally frequent, contracted, and tense; but in some cases it is but very little disturbed. The face is for the most part pale, and the tongue white, punctuated with red points, and covered with a layer of transparent mucus. When the disease is fully developed, deglutition is very difficult and painful, and apt to excite alarming and distressing paroxysms of suffocative breathing. The temperature of the surface is unequal, being higher than natural in some parts, and lower in others. One of the most peculiar and characteristic symptoms of this affection, says Dr. Armstrong, is the inability of patients to cough out, as is done in pulmonic or catarrhal affections; the attempt to do so resulting in a kind of suffocating effort, terminating "in a low, grumbling, and almost grunting sort of noise in the throat." Respiration somewhat impeded from the onset of the disease, becomes more and more oppressed and laborious as the disease advances, with occasional violent and distressing paroxysms of dyspnœa, until at last, in unsubdued cases, death occurs by actual suffocation.*

In some instances, laryngitis is as insidious in its approach as it is rapid and fatal in its progress. Mr. Porter knew two instances of young men who went to bed at night, without complaining of any illness, "and were found dead from this affection the next morning." M. Leveille has reported a case of laryngo-bronchitis, which was so masked by erysipelas of the face, as to escape observation until within a few hours of its fatal termination.†

"The seat of this affection," says Mr. Porter, "is more in the cellular tissue, connecting the mucous membrane with the adjacent parts, than in the membrane itself, although this latter structure is very frequently found to have been inflamed." The epiglottis, rima-glottis, soft palate and larynx, are always tumefied and œdematous by inflammation and serous effusion into the submucous cellular tissue, so as to approximate the sides of the glottis and prevent the passage of air into the lungs. In some instances the inflammation is confined to the larynx, but it occasionally is found to have extended down the trachea and even into the bronchia. (Armstrong.) Porter, however, observes, "I can find no satisfactory examples of the inflammation having extended beyond the larynx and into the trachea; on the contrary, the chief intensity of the disease has been in the epiglottis, which is found red, erect, thickened and swollen, and during life resembles a piece of raw meat."‡ In the case reported by Leveille, the inflammation was manifest from the larynx down along the trachea and in the bronchia.

The inflammation has been known to terminate in the formation of one or more abscesses in the parts surrounding the larynx. Armstrong mentions a fatal case in an old woman, in which "a considerable abscess was found between the

* ["This formidable malady has always existed, for you may trace examples of it, under various names, even in the writings of the ancients. But it is only in recent times that it has been singled out from the rest of the anginæ, and made a separate object of study. It has numbered some distinguished medical men among its victims: Dr. David Pitcairn, Sir John McNamara Hayes, Sir George Tathill. The celebrated General Washington died of it."—*Watson's Lectures*, p. 443.]

† Gazette de Santé, 1827.

‡ Observations on the Surgical Pathology of the Larynx and Trachea, &c. By Wm. Henry Porter, p. 98.

muscles of the pharynx and the bodies of the cervical vertebræ." In some instances false membrane is found on the epiglottis, tonsils and trachea.

Treatment.—Laryngitis is to be regarded as one of the most rapid and dangerous affections. It often terminates fatally in less than twenty hours, under the most prompt, energetic and judicious modes of treatment. *Blood-letting* is unequivocally indicated, and yet its effects in arresting the progress of the inflammation in this affection, do not appear to equal those it manifests in other varieties of tracheal inflammation. Dr. Armstrong asserts, that in one instance, "one hundred and sixty ounces of blood were drawn within the space of six hours," by venesection and leeches, yet "so far from arresting the inflammation, the patient died within twenty-four hours." In only one case out of six, he says, did blood-letting appear to afford unequivocal advantage. It must be admitted, indeed, that bleeding does not often procure any prominent benefit in this affection; and yet who would undertake to treat the disease without resorting to prompt and efficient depletion? Dr. Beck, of New York, attributes the want of success of this measure in laryngitis to the inefficient manner in which it is usually employed. When carried to the extent of producing syncope, it is, he thinks, as likely to do good in this as in other inflammatory affections of the respiratory passages. My own experience does not, however, entirely confirm this observation. Nevertheless, blood-letting to the *extent of producing fainting* must be regarded as an indispensable auxiliary in the treatment of this affection.* Leeches should be largely applied to the throat. Martinet has reported a case which terminated successfully under the employment of general and local bleeding and blistering. In the course of three days upwards of forty ounces of blood were drawn with the lancet, and 110 leeches applied to the throat and back of the neck. *Blistering* the throat or the back of the neck, while leeches and emollient poultices are applied to the throat, will in general assist materially in the reduction of the disease. Armstrong places more reliance on the repeated employment of antimonial emetics in this disease, than on any other remedial measure. After having found blood-letting and local applications ineffectual in the majority of cases that had come under his care, he was induced to try the effects of emetics, "given in repeated doses, till free and frequent vomiting was produced." He accordingly gave antimonial emetics in five cases, for which he was subsequently called to prescribe. "No circumstance in my professional life," he says, "ever gratified me more than the great and sudden relief which vomiting afforded; in reality it removed all the urgent symptoms at the time, and being re-excited as soon as ever the slightest signs of stricture in the larynx returned, at last completed the recovery." In a well-marked case which I recently attended, in a child about four years old, blood-letting, to the extent of about ten ounces, with a blister to the throat, and three active emetics, effected a cure. *Purgatives* must not be neglected in the management of this affection. Calomel either by itself in large doses, or in union with rhubarb or jalap, should be given so as to keep up a free action of the bowels. Some advantage may, perhaps, be derived from warm and stimulating applications to the feet, such as warm pediluvia or sinapisms. Dr. Good recommends the use "of gargles of ice water acidulated, and

* ["How and when are we to employ the great remedy for acute inflammation—blood-letting? or are we to employ it at all? These are points concerning which it is quite necessary that our minds should be prepared and prompt to decide. If you look merely at the results of the recorded cases of this fearful complaint, you will scarcely find an answer to the question. In some of them, copious bleeding appeared to save the patients; in others, it was of no service, but rather seemed to accelerate their death. Sir John McNamara Hayes suffered two attacks of cynanche laryngea. In the first he was bled freely. Dr. Roberts, of Startford, informs us that the first bleeding was attended with *considerable relief*, the second also with *manifest advantage*, and by the third, *his safety appeared to be ensured*. Fifteen years after, he died of the same disorder, for which he was again bled and leeched under the care of the late Dr. Baillie. Washington was largely bled and died. Again, Dr. Francis, of New York, recovered from acute laryngitis after copious venesection. It is evidently needful to consider and determine the circumstances under which we are to use or to withhold the lancet."—*Watson's Lectures*, p 444.]

epithems of pounded ice applied externally," in preference to blisters to the throat. I have seen an instance of this disease in which the application of a solution of lunar caustic, by means of a soft pencil to the inflamed fauces, (as is recommended by Mackenzie in the somewhat similar affection, recently described by Bretonneau, under the name of *diphtherite*,) was evidently beneficial.

It is probable that the insufflation of very finely powdered alum into the fauces, (a practice successfully adopted by Laennec in cynanche trachealis,) would prove beneficial in this affection. The powdered alum may be blown into the fauces through a small tube or quill.

The operation of bronchotomy is recommended by some writers, where the remedies already mentioned do not make any effectual impression on the disease. "Besides the uncertainty that must prevail as to the precise nature of the morbid action that is going on in acute laryngitis, and the consequent hazard a practitioner will run of losing his patient, whilst he is attempting a treatment that may be unsuccessful, there are many reasons why he should in the present instance decide at once on the performance of bronchotomy. Thus it allows the organ in which the diseased action is situated to remain in a perfect state of repose. Considered as a wound, it adds nothing to the patient's danger; and as the relief it affords is, at least for a time, complete, it imparts confidence to the surgeon, and allows him more leisure to examine the symptoms and adopt the remedies accordingly. If, however, the operation be not early performed, it had much better be let alone altogether."*

A highly interesting instance is related of the successful performance of tracheotomy, in a case of laryngitis, by Dr. Crampton, in the fourth volume of the *Dublin Transactions*. Professor Regnoli, also, has reported two successful instances of this operation in *chronic* laryngitis. The acute form of the disease, he observes, sometimes terminates in chronic œdematous tumefaction of the epiglottis, and the mucous membrane of the larynx, with or without thickening of the submucous cellular tissue, which will ultimately render respiration extremely difficult, and even cause death by suffocation. Here bronchotomy is the only means of relief in our power.†

Sect. III.—*Cynanche Trachealis.*—*Croup, Hives.*

Symptoms.—This disease sometimes comes on suddenly, and acquires the utmost degree of violence in the course of a few hours. More commonly, however, its approach is gradual, the first symptoms being those of ordinary pulmonary catarrh. A dry and hoarse cough, with slight difficulty of breathing, and a change of the voice, are generally the first intimations of its invasion. This very peculiar hoarse and rough cough, with its accompanying slightly oppressed breathing, continues sometimes, with occasional remissions, for several days, before the disease assumes its characteristic form and violence. More or less febrile excitement is generally present, from the very commencement of the disease. Sooner or later the respiration becomes more difficult and distressing; the febrile reaction rises higher; the voice becomes more indistinct, whispering, or annulled; slight pain and uneasiness are felt in the larynx; and the cough becomes more sonorous. The disease now advances rapidly to its state of full development, and all the symptoms acquire a most alarming and distressing degree of violence. The countenance is flushed; the eyes prominent, injected and heavy; the pulse frequent, tense, and quick; the skin dry and hot; and the respiration extremely difficult and anxious. *Inspiration* is especially difficult, and accompanied with a very peculiar ringing or stridulous sound. The cough at this time is often quite dry; but in some instances, there is a copious and

* W. H. Porter. Loc. citat., p. 100.

† Nuovo Mercurio delle Scienze Mediche. Mazo, 1829.—See *Rev. Médicale*, Juin, 1829.

very tenacious albuminoid fluid secreted in the larynx and trachea, from the very onset of the disease, and in all cases this viscid secretion occurs in the advanced stage of the malady. If the disease be not checked in its violence and progress, the breathing acquires, at last, a degree of oppression inexpressibly distressing; the little patient manifests, in the expression of its countenance and actions, the utmost degree of anguish and suffering; the head is thrown backwards, and the mouth kept open; the eyes are half closed or cast about with an imploring expression for relief; the voice is extinct; the lips livid; the face pale and covered with large drops of sweat; sensibility rapidly diminishes; slight coma ensues; the extremities become cold and clammy; and finally breathing stops and closes the agonizing scene.

Such are the ordinary course and symptoms of this frightful malady. Much diversity, however, occurs in relation to the degree of violence and rapidity of these phenomena. In some instances, not more than a few hours elapse between the commencement and fatal termination of the disease. In other cases, the symptoms proceed slowly to their acme, and the disease is protracted for many days, and occasionally even for several weeks, assuming a chronic character, without, perhaps, having at any time manifested a very alarming degree of violence. The ordinary period occupied by this disease, is from two to five days.

Causes.—Cynanche trachealis is one of those inflammatory affections for which a predisposition appears not unfrequently to be congenital. It is certain, at least, that the children of some families are particularly predisposed to the disease, whilst in others it never makes its appearance. In what this predisposition consists, we cannot tell. To say that it depends on a peculiar organization of the mucous membrane of the larynx and trachea, may be correct; but what these organic peculiarities are, it would be in vain to inquire. Besides this original or natural predisposition, there is another one much more universal and influential in its agency, namely, *age*. Cynanche trachealis is, indeed, almost peculiar to the age of childhood, being vastly more common in children between the first and fifth year of age than in the whole subsequent and anterior periods of life. It is, nevertheless, not wholly confined to the years of infancy and childhood; for occasionally, though rarely, it occurs in adults, and sometimes even in very advanced age. This aptitude to the disease in early childhood may depend, in part, on the peculiar condition of the glottis or larynx at this age; for, that there exists some peculiarity in this portion of the respiratory passage, during infancy and childhood, unconnected, probably, with mere size of aperture, is manifest from the characteristic voice, at this early period, and its remarkable change during the period of pubescence. But there is another circumstance which may have a large share in the so common occurrence of this malady during infancy, namely, the almost universal custom of dressing children so as to keep the neck and upper part of the thorax perfectly bare, and thus rendering them more liable to the injurious influence of cold in these parts. Certain exanthematous affections, also, often give rise to an increased aptitude for this disease. This is especially the case with scarlatina, measles and miliary fever. Observation would seem to show that florid, robust and fat children are much more liable to the disease than those who are of an opposite habit.

The principal *exciting* cause of this disease is cold or sudden vicissitudes of atmospheric temperature; and hence its greater prevalence during the variable, damp, and cold months of autumn and spring, than in the more temperate and uniform season of summer. Cynanche trachealis is said to have prevailed epidemically; but contrary to what obtains, in this respect, with epidemic catarrh, these epidemic cynanche are always of a very limited sphere, with regard to the extent of country which they embrace. In general, this disease is most apt to prevail after, or during the prevalence of measles or scarlatina. During convalescence from these affections, there exists an especial aptitude to cynanche from the influence of cold. It would seem, too, that the liability to this disease is often considerably increased, by having suffered an attack of it. I have known

the same individual suffer five or six attacks of the disease, during the period of childhood.

Cynanche trachealis is a phlegmasial disease, consisting essentially of inflammation of the mucous membrane of the superior portion of the respiratory tube. The correctness of this pathology is confirmed not only by the known character of its most common exciting cause, but especially, also, by the more direct evidence of the symptoms of the disease, and the appearances discovered on post-mortem examination.*

The observations of Bretonneau in France, and of Mackenzie in England, published within a few years past, go directly to the establishment of this view of the nature of the disease. Both these observers assert that the inflammation often commences in the fauces and on the tonsils, and descends thence into the trachea; a progress of the disease, which may be verified by ocular inspection. I have myself seen several cases of croup, which commenced by a kind of erysipelatous or superficial inflammation, about the tonsils and soft palate; and in one instance, this inflammation continued for four days, and was the object of medical attention before it extended into the trachea and gave rise to the symptoms of croup.† The inflammation which occasions the characteristic phenomena of this disease, rarely remains confined to the larynx and trachea. In many instances, it extends downwards into the bronchia, and sometimes even into the small ramifications, giving rise to the simultaneous existence of acute bronchitis and laryngeal inflammation. The danger from this disease is always greater, *cæteris paribus*, in proportion as the inflammation passes down into the

* [Although croup consists essentially in an inflammation of the lining membrane of the trachea, (*i. e.*, in the part below the larynx and above the bifurcation into the bronchi,) the disease sometimes extends higher up so as to affect directly the larynx, and still more frequently lower down so as to occupy the extreme ramifications of the bronchi. When the inflammation does not extend upwards into the larynx, the muscles of the glottis may nevertheless be thrown into spasmodic contraction by reflex sympathy. Dr. Watson, in his lately published lectures, makes the following excellent observations. "Cullen makes no distinction between cynanche trachealis and cynanche laryngea. Yet they are separated from each other by very definite boundaries. They differ in anatomical position; they differ in gravity. Both, indeed, are serious diseases, but croup is the more serious, because it seldom admits that mechanical relief (tracheotomy), which, when rendered in time, deprives cynanche laryngea of its dangerous character. The two disorders differ also in respect to the period of life at which they occur. Idiopathic laryngitis is seldom met with except in adults, croup seldom after the age of puberty. Cynanche trachealis is, indeed, a very remarkable disease—for it exhibits an event of inflammation which does not usually belong to that process when it affects the *mucous* tissues. In this, too, it differs from laryngitis. I say that croup is peculiarly a disease of early life. The interval that lies between the two periods of weaning and puberty is the time during which its visitation is chiefly to be apprehended. Comparatively few cases of it occur during the first year of infantile life. There are more in the second year than in any other."—"Some of the cases recorded of croup in the adult were probably in reality cases of laryngitis. It is curious that inflammation should thus at different epochs of life fix itself upon limited portions of the same continuous surface, and give rise to consequences so diverse. We are unable to give any account of this." —Mc.]

† It is surprising that a disease so manifestly *phlogistic* in its character should still be viewed by some of the German and French writers as essentially spasmodic in its nature, or, at least, as wholly independent either of a local or general inflammatory condition. Several of the late continental writers on this disease regard the fever and inflammation, which they acknowledge sometimes to exist, as wholly accidental, and as in no manner essential to the perfect constitution of the malady. Among the principal antiphlogistic pathologists, in relation to this affection, may be mentioned Des Essartz, Banafox,(*a*) Ruette,(*b*) Schneck,(*c*) Lobstein.(*d*) Professor Nasse regards impaired or disturbed function of the pneumogastric nerves as the proximate cause of the disease. The symptoms which characterize this disease, he asserts, bear a very strong resemblance to those which result from the division of the eighth pair of nerves. The inflammation which occurs in the mucous membrane of the respiratory passages is, according to his views, secondary, and the consequence of the disordered function of the pneumogastric nerves.

(*a*) Journ. de Med. Chir. Pharm., &c , tom. xxxvii. November, 1816.
(*b*) Traité de l'Asphyxia connue sous le nom de Croup.
(*c*) Bib. Med , tom xli. p 256.
(*d*) Mem. de la Société Méd. d'Emulation, 8° année, 2e part, p. 538.

bronchial ramifications. Indeed, when bronchitis coexists extensively, the result must almost inevitably prove unfortunate.

In some instances, the laryngo-tracheal inflammation terminates, after a shorter or longer period from its commencement, in the formation of a false membrane; which, according to the latest and most accurate observations, appears to consist of a concrete albuminoid secretion.* In other instances, the inflammation terminates in the secretion of a muco-purulent matter of an opaque and yellowish appearance, without the formation of a pseudo-membranous substance. There are other cases, again, and these are perhaps much the most common, in which the inflammation produces neither false membrane, nor a puruloid matter, but an extremely copious secretion of a very viscid, limpid, and frothy mucus.† M. Blaud, in his excellent work on this disease, maintains that these different modes of termination constitute good grounds for dividing the disease into three principal varieties, indicating three different grades of inflammation. The inflammation, he says, is at the highest grade of violence, in those cases which are attended with the formation of false membrane. It is less violent in the instances where there is only a muco-purulent fluid formed; and in those cases in which a copious secretion of a tenacious, limpid, and frothy mucus occurs, the inflammation is at its lowest grade. In the first and most aggravated variety of the disease, the cough and respiration are always dry, or free from that peculiar rattling sound in the respiratory passages, which occurs, when these contain viscid secretions. This dryness of the cough usually continues for many hours after the disease is fully developed. The pain in the larynx is often very considerable, and the febrile reaction is generally violent. The period at which the false membrane is formed, after the commencement of the inflammation, appears to vary considerably. In some cases M. Blaud found the larynx and trachea lined with such a membranous substance, although the whole course of the disease did not occupy more than twenty hours; in other instances, several days appeared to elapse before it was formed. Occasionally, only a part of the internal surface of the larynx is found coated with this concretion; but in some instances, it has been found to extend into the bronchia, and even into the smaller divisions. Sometimes, instead of a membranous expansion, we find, on dissection, the upper part of the trachea almost entirely blocked up by a thick mass of the concreted albuminoid secretion, lodged just within the glottis.

In cases in which this membranous substance is not formed, the cough early becomes somewhat humid, and the respiration rattling; and before the disease has continued many hours, the mucus in the larynx and trachea is so copious as to threaten suffocation by obstructing the glottis. M. Blaud thinks that the extremely viscid mucus which is formed in these milder cases, is entirely different in its properties from the secretion which occurs in the former variety—and that it is incapable of being so inspissated as to give rise to a pseudo-membranous substance.

Whatever may be thought of M. Blaud's division of this disease, or of his sentiments in relation to the *radical* distinction between the inflammation and secretion which give rise to *membranous* structures, and that inflammation and its consequent *mucous* secretion which occur in cases unattended with the formation of false membrane, it must be admitted, that there exists at least a twofold diversity in relation to the immediate local consequences of the laryngo-tracheal inflammation—namely, one variety in which false membrane is formed, and in which the cough and respiration are at first dry, or do not indicate the existence of much mucus in the respiratory passages; and another variety in which the cough and respiration are humid, in the early period as well as throughout the

* According to the experiments of Schwilgué, this membranous substance is insoluble both in cold and in boiling water, but perfectly soluble in a solution of the alkalies. By incineration, it yields deuto-carbonate of sodium, proto phosphate of lime, &c.; corresponding, thus, entirely with the properties of coagulated albumen.

† Nouvelles Recherches sur la Laryngo-Trachéite. Par P. Blaud. A Paris, 1824.

disease, and in which a very copious secretion of transparent and extremely viscid mucus occurs. The former are exceedingly dangerous, nay, almost hopeless, unless subdued by the most prompt and powerful antiphlogistic measures, in their very onset. The latter are much less dangerous, and may generally be cured by more moderate antiphlogistic measures, and the expulsion, from time to time, of the tenacious mucus from the larynx and trachea.

In nearly all cases, the mucous membrane of the larynx and trachea is found very manifestly congested on dissection; and the glottis is frequently considerably narrowed by a kind of thickening or tumefaction of its lips.

With regard to the *ratio symptomatum*, it may be observed, that the immediate cause of the distressing difficulty of respiration, and finally of death, consists in an obstruction to the passage of the air into the lungs. The circumstance which causes the exclusion of the air from the lungs consists either in a spasmodic closure of the glottis, or in an occlusion of this aperture by tumefaction of its sides, or by the formation of false membrane or a mass of concrete lymph, or, finally, by an excessive quantity of a very ropy and viscid mucus closing up the passage. Death is also sometimes the immediate consequence of a copious serous effusion into, and consequent choking up of, the bronchial cells, a mode of termination which almost always occurs when the inflammation descends into the bronchial ramifications. Spasmodic contraction and closure of the glottis may be caused by irritation excited by the upper portion of the false membrane.

Prognosis.—Laryngo-tracheitis is always to be regarded as a very dangerous affection. Formerly the majority of cases terminated fatally; but under the present improved pathology and mode of management, the proportion of fatal cases is greatly diminished. Frightful and unmanageable as this disease is, when suffered to pursue its course uncontrolled, or when opposed by inadequate means, it is, nevertheless, almost as much under the dominion of a prompt and vigorous antiphlogistic treatment, as any of the more serious phlegmasial affections. The degree of danger appears to be proportionate to the violence of the inflammation, and the extent to which it may have passed downwards into the pulmonary passages. It would seem, also, that the more sudden the attack, when attended with strong febrile excitement, the greater, in general, is the danger. When, however, the disease supervenes suddenly without fever, the attack may be presumed to be purely *spasmodic*,* and may readily yield. The shriller and more sonorous the cough, the more reason is there to apprehend danger. It must be observed, however, that the prognosis in this disease is often extremely fallacious. Sometimes the symptoms yield, and promise a speedy convalescence, when a violent exacerbation will suddenly supervene and destroy the patient; and on the other hand, death may appear to be impending, when on the sudden expulsion of a membrane, or even without such an occurrence, a rapid change for the better will ensue, and lead on to full convalescence.

Diagnosis.—There is but one disease which may be mistaken for laryngo-tracheitis, namely, *spasmodic* or *cerebral* croup. From this latter form of disease it may be distinguished by—

1. The attack of cynanche laryngo-trachealis generally coming on *gradually*, with the ordinary initial symptoms of catarrhal affections; spasmodic croup always supervenes *suddenly*, and is rarely preceded by catarrhal symptoms. When the former *does* come on suddenly, which is sometimes the case, it is so manifestly a febrile affection, that, by this circumstance alone, it may be readily distinguished from the spasmodic disease.

2. Cynanche is essentially a febrile affection; spasmodic croup is free from fever, except it be accidentally present.

3. Cynanche is often attended with considerable *remissions*, but not with complete *intermissions*, except perhaps immediately after vomiting. Spasmodic croup is often marked by *complete intermissions* of considerable duration.

* Under the head of Asthma some observations are made on Spasmodic Croup.

4. Cynanche is always attended with a hoarse and sonorous cough, and frequently with a copious secretion of viscid mucus in the trachea. Spasmodic croup is rarely accompanied with much cough, frequently none at all, and it is always dry.*

5. The peculiar stridulous sound of the cough and inspiration, so characteristic of cynanche laryngo-trachealis, does not occur in spasmodic croup.

6. In spasmodic croup the pulse is small and contracted, and the skin not above the natural temperature. In cynanche, the pulse is excited and irritated, being generally full, frequent, quick and tense; and the temperature of the surface is febrile, except towards the fatal conclusion of the disease, when, from the imperfect function of respiration, animal heat ceases to be generated in its normal proportion.

Treatment.—From what has been said above of the nature and character of this disease, it is obvious that the general indications to be kept in view in its treatment are: 1. To subdue the local and general inflammatory action as speedily as possible; and, 2, to promote the discharge of the viscid and coagulable secretions which are lodged within the superior portions of the respiratory tube. For the fulfilment of the former of these indications, the most prompt and energetic antiphlogistic measures must be adopted. He who loses sight of, or neglects this all-important indication, and places his hopes in one or more of the empirical remedies that have, by different practitioners, been extolled for their supposed specific tendency to counteract the tracheal affection, will, we may be confident, have but little reason to flatter himself for his success in the management of this malady.†

The remedy upon which we must place our principal reliance for the reduction of the tracheal inflammation, is *blood-letting*, in conjunction with external vesicating or irritating applications to the throat. Here, however, as in most of the other phlegmasial diseases, the good effects of the lancet are confined to the early period of the disease. If bleeding be neglected, or inefficiently employed, in the first stage of the malady, its progress will be extremely perilous, whatever other remedial measures may be adopted. When called to a patient laboring under this disease, in whom the manifestations of high febrile excitement and active tracheal inflammation are conspicuous, a vein should be opened, and the blood suffered to flow until an approach to syncope is induced. As soon as this effect is produced, all the distressing symptoms usually subside. If in the course of an hour or two the difficulty of respiration reappears, and the pulse be not soft and feeble, more blood should be drawn, and again to the extent of inducing an approach of syncope. I have been obliged to open a vein three or four times in the course of twelve hours, before a permanent and decisive impression was produced on the disease. Such copious depletion is, however, demanded only in cases where the local and general inflammatory action is strong—where the pulse is tense, hard, quick and vigorous, attended with a dry and sonorous cough and respiration. Such cases are apt to terminate in the formation of a false membrane in the larynx; and our efforts ought to be prompt and vigorous to reduce the inflammation below the grade necessary for the formation of pseudo-membranous matter. After the effusion which gives rise to

* Dr. Rush has published an account of a dissection of a child that had died of spasmodic croup. In this subject, no membrane, nor even mucus was found in the respiratory passages, nor did the lungs exhibit the slightest traces of previous disease.

† It was owing to physicians not attending to the essentially inflammatory nature of this affection, and the consequent indispensableness of prompt and vigorous antiphlogistic measures, that this disease was formerly so much more frequently fatal than it appears now to be. It is also owing to this error, or rather to the erroneous views which have been so common concerning the pathology of this disease, that so many physicians have objected to the employment of blood-letting, and expressed their willingness to confide in *mercury*, *polygala senega*, *carbonate of ammonia*, and *hepar sulphuris*, to the exclusion of the direct and powerful antiphlogistic means long since so universally and so successfully practiced by American physicians.

the membrane has taken place, bleeding will afford but moderate and temporary advantage.

It must also be observed, that where the disease is attended with but moderate symptoms of febrile excitement; where the pulse is not hard, or tense, though accelerated; and especially where, in addition to these manifestations of a moderate febrile excitement, the *cough and respiration are attended, early, with a copious, transparent, and viscid mucus*, blood-letting need very seldom be employed to the extent just mentioned, and may even, in some instances, be wholly dispensed with.*

Emetics are important remedies in this disease, and may, indeed, be regarded as indispensable in its remedial management. Assisted by warm pediluvia, mercurial purgatives, and rubefacients to the throat, I have frequently subdued mild attacks of the disease without the aid of direct depletion. In those cases that are early attended with a copious secretion of viscid mucus in the larynx and trachea, emetics are especially useful. They tend not only to expel this tough mucus from the larynx, and thus to give a temporary freedom from the dyspnœa, but also to equalize the circulation, and to promote the cutaneous exhalation, as well as to diminish the general arterial excitement by the nausea which precedes and accompanies their operation. In *infants* affected with this disease, the occasional employment of an emetic is particularly important; for at this early age, no voluntary efforts are made to dislodge and expel the viscid secretion from the larynx, and which, if not removed, may by itself cause suffocation. In those violent cases, which manifest a highly inflammatory character, and in which the cough and respiration *are dry* during the first stage, there is commonly but little advantage gained from the operation of an emetic, so long as this dryness of the larynx and trachea continues. In such cases the proper period for the administration of emetics commences with the appearance of the viscid secretions, which always sooner or later occur in the respiratory passages, and from which the disease derives its most serious and dangerous character. Without doubt, from the general antiphlogistic tendency of nausea and emesis, some benefit may result from the exhibition of emetics before any morbid secretions occur in the larynx; but the peculiar advantages of this class of remedies are most assuredly more conspicuously displayed when the upper portions of the windpipe are clogged with a viscid fluid, which requires expulsion. In the advanced periods of the disease, there exists often so much torpor or insensibility of the system, in consequence of the imperfect decarbonization of the blood and vascular congestion in the brain, that great difficulty is experienced in procuring the operation of emetics. To obviate this gastric insensibility, and procure emesis, we must endeavor to diminish the sanguineous congestion in the head; and this may, in general, be readily accomplished by putting the patient's feet in warm water, and applying a napkin wet with very cold water, to the head. The abstraction of blood, too, while the patient is supported in a sitting or erect posture, will rarely fail to ensure the operation of an emetic under the circumstances in question. The articles I prefer as an emetic in this disease are calomel in combination with tart. antim. I commonly administer from five to six grains of the former article with one-fourth of a grain of tart. antim. to a child of from two to five years old. I have frequently given from eight to ten grains of calomel

* In no country is blood-letting so actively employed in this, as indeed in all other inflammatory affections, as in America. The value of this evacuation in the present disease has been long understood by American physicians, whilst in Europe it was, until lately, looked upon as an equivocal, if not an injurious measure. Even those who admitted the inflammatory nature of the disease bled but very sparingly. To this there are indeed some remarkable exceptions. Ferriar recommends bleeding *ad deliquium*. (*Med. Histories.*) "This," says he, "is the essential point, without which no relief can be effected." The same practice is strongly inculcated by Drs. Bayley and Middleton. (*Cases of Angina Trachealis, with the Cure, in Letters to William Hunter, M. D.*, 1781.) And in the late medical journals observations may be found equally favorable to decisive depletory measures in this formidable malady.

alone, and have very generally found it to excite active vomiting in a short time. The peculiar advantages which appear to me to belong to this practice, are the protracted and great degree of nausea which the calomel produces, an effect which has a powerful antiphlogistic tendency; and the alvine evacuations which almost always speedily ensue. Besides these effects, great benefit may be expected from the early constitutional influence of the calomel—an influence which in the present disease, especially, is very generally acknowledged to be highly salutary. Be this as it may, universal experience decides in favor of the employment of emetics in this disease. Tart. antim., ipecacuanha, sulph. zinci, squills, sulph. cupri, have all been used and recommended in this affection; and where the object is merely the expulsion of the tracheal mucus, or pseudo-membranous matter, any of these articles may answer our purpose.* In some instances, where the accumulation of the tenacious secretion is very rapid, it becomes necessary to repeat the emetic three, four, or five times in the course of twenty-four hours.

M. Jadelot recommends the following mixture as an emetic in croup, after proper depletion has been practiced:

℞.—Infus. polygalæ ℥iv.
Syrup ipecac. ℥i.
Oxymel scillæ ℥iij.
Antimon. tart. grs. iss.—M. Take a spoonful every fifteen minutes, until vomiting is produced.

Purgatives are useful *auxiliary* remedies in the treatment of this disease. In the onset of the complaint the bowels should be briskly evacuated, and two or three evacuations should be subsequently procured daily until the inflammation is subdued. After the first purge, which should be energetic, it is best to employ the gentler articles of this class of remedies; for very active catharsis tends to exhaust the resources of the system without procuring any peculiar advantages over milder aperients, and may even do harm. After the first cathartic, it will, in general, be sufficient to keep the bowels in a loose state by laxative enemata.

Calomel, given with a view to its constitutional influence, is a remedy which has been, and by many is still, much extolled in the treatment of this disease. Many of the continental writers seem to look upon it as decidedly the most valuable means we possess for removing the local tracheal affection. In our own country, too, this article has found some eminent advocates as a remedy in inflammatory croup. The late Dr. Rush placed great reliance on its powers in this disease; for he asserts, that when given in large doses in the commencement of this disease, and continued afterwards in smaller doses, "it is hardly less efficacious in this complaint than the Peruvian bark is in intermittents." Dr. Hosack also speaks very favorably of the employment of calomel and James's powder in combination, given at short intervals in the second stage of the complaint; and the late Dr. Bard placed much reliance on its powers. That the constitutional influence of mercury is calculated to do good in croup, I am well persuaded from my own experience. It tends in no small degree to reduce the local laryngo-tracheal inflammation, and to counteract, as it would appear, the formation of the pseudo-membranous exudation. Its operation in this respect is, however, much too slow to afford particular advantage in the more acute and rapid cases of the disease, many of which run to a fatal termination in less than twenty-four hours. Where the complaint assumes somewhat of a chronic character, we ought not to lose the advantages which may be derived from this remedy. My usual mode of giving this article, after the first or second emetic,

* I have, in a few instances, prescribed an infusion of the lobelia inflata with the happiest effect. From its known very powerful influence upon the respiratory function in asthma, independent of its emetic operation, there is some reason for presuming that, in relation to the present disease, it may possess peculiar virtues, and my limited experience with it inclines me to this opinion.

is to exhibit one grain every hour or two, with about one-fourth of a grain of ipecacuanha.

The *warm bath*, also, is a very useful auxiliary in the treatment of this disease. Employed along with the remedies already mentioned, its benefits are often very considerable, more especially where the skin is very dry and hot. Its usefulness is, however, confined to the early periods; for, in the advanced stages, the skin is generally bathed with profuse perspiration, and the pulse weak and soft.

Concomitantly with the preceding remedial measures, external rubefacient and vesicating applications to the throat ought, in all instances, to be employed. One of the first measures after bleeding should be the application of a blister, or some irritating substance, to the throat of the patient. I prefer the application of the spirits of turpentine to blisters or any other similar article. The action of the turpentine on the skin is prompt and powerful; and if the derivative powers of such applications be proportionate to the degree of irritation and pain they produce, few articles can equal the present one in this respect. A piece of flannel may be imbued with the turpentine and applied round the neck. Children seldom will bear this application for more than twenty or thirty minutes at a time. It must therefore be removed and reapplied from time to time, according to the violence and permanency of its effects on the skin. In general, it has appeared to me that active rubefacients are preferable to blisters in this complaint. They generally act with promptitude and force, a circumstance of no small consideration in a disease which often runs its course in a few hours. A blister requires from four to five hours before its effects on the skin can be of any particular avail. An efficient blood-letting ought always to precede such applications in cases attended with high febrile excitement. The oil of the *monarda punctata*, with an equal proportion of camphorated liniment, forms also an excellent rubefacient in this affection. Where the disease proceeds slowly, the use of a blister will be preferable to rubefacients.

With regard to the local abstraction of blood by means of leeches, general experience does not enable us to ascribe any peculiar advantages to it. It has never yet appeared to me to afford any greater advantage than if the same quantity of blood had been drawn with the lancet.

Besides the foregoing remedial measures, which may be justly regarded as decidedly the most direct and powerful means for combating this malady, a number of other remedies have been recommended, some of which have been distinguished by the title of *specific*. Among these pretended specifics, the *polygala senega* and the *hepar sulphuris* (deuto-sulphur of potassium) have attracted the most attention. The former of these articles is, without doubt, a useful medicine in certain states of this disease; but it is, most assuredly, far from possessing the powers which were formerly ascribed to it by Archer and others. In the commencement of the disease, especially in the more violent cases, it is objectionable on account of its stimulating properties; but after the complaint has been in some degree subdued, or lost its acute inflammatory character, its influence is often conspicuously beneficial. For the removal of the dry and hoarse cough and slight oppression of the respiration, which, in some instances, remain after the inflammation has been subdued, we possess no remedy equal in usefulness to the polygala. It is, moreover, a decidedly useful remedy in all instances of chronic croupy affections, and in the catarrhal and pectoral affections which remain as the sequelæ of this and other acute affections of the respiratory organs. It is best given in decoction. An ounce of the root to a pint of boiling water, suffered to simmer for 15 or 20 minutes, and afterwards sweetened with honey. The dose of this is about an ounce every hour or two, according to the urgency of the symptoms.

With regard to the *hepar sulphuris*, a remedy introduced to the notice of the profession about sixteen years ago, in a prize essay on this disease presented to

the French *Ecole de Médecine*,* little can now be said in commendation of its powers. Its introduction was founded on the erroneous doctrine that croup consists essentially in a morbid coagulability of the tracheal mucus, and which, it was asserted, the sulphuret of potash had the power of preventing or altering. It need scarcely be observed, however, that a remedy which might possess such power, without, at the same time, exerting any influence in subduing inflammation, could afford us but little advantage in this affection; and the result of later experience goes to show that this at first highly lauded remedy exerts no decided influence over the tracheal inflammation. It would be a waste of time, to pass in review the various other remedies of this kind, which have at times been praised, and again abandoned as curative means in this disease. As well might we look for specifics for the cure of pleurisy, phrenitis, or gastritis, as to expect to find one for laryngo-tracheitis.

It has already been stated above, that the exudation of albuminoid fluid, which forms the false membrane, frequently commences on the surface of the tonsils, and thence spreads along the arches of the palate, and at last descending over the internal surface of the pharynx and œsophagus, as well as the larynx and trachea. According to the experience of Dr. Mackenzie, the application of a solution of the nitrate of silver to the tonsils, velum palati, and uvula, will, in such case, frequently remove the membranous crust completely, and produce speedy and great relief, and ultimately entirely remove all the symptoms. The solution employed by him is of the strength of a scruple of the nitrate of silver to an ounce of distilled water. I have seen one instance in which this application was made, and the result gave me a very favorable impression of this practice. It must of course be confined to those cases in which the fauces are found, on inspection, to present an irritated and inflamed condition.† Dr. Laennec has lately published a statement, from which it appears that insufflation of very finely powdered *alum* generally affords great and speedy relief, not only in this variety of the disease, but also in cynanche laryngea and tonsillaris. As cases of this kind are not uncommon, the practitioner ought in all instances to examine the fauces; and where the soft palate and tonsils are found to be inflamed and œdematous, a local application of the kind just mentioned ought at once to be made. The success of the treatment must depend materially on the prompt reduction of this primary extra-laryngeal inflammation.

With a view of expelling the false membrane, emetics have been recommended in the advanced period of the disease, and the records of medicine are not wanting in instances in which this object was effected by such a measure. It offers, however, but an exceedingly slender foundation to build any hopes upon. The same object has in one or two instances been obtained by exciting violent sneezing by blowing snuff into the nostrils through a small tube. As to the proposed operation of tracheotomy in order to detach and remove the membrane, all experience has so far decided against it.‡

* Rapport sur les ouvrages envoyées au concours sur le *croup*, par la commission chargée de l'examen et du jugement de ces ouvrages. Paris, 1812.

† [I have applied the solution of nitrate of silver, 30 grs. to the ounce, with decided effect; and I often use the solid caustic with great advantage. But the best results are obtained from the application on the outer integument covering the whole of the larynx and trachea so as to blacken, and, in some cases, to vesicate the parts. This deadens the irritation of all the parts below, and relieves the inflammation and hoarseness very speedily. I have twice known it to detach the included false membrane, and cause the little sufferers to expectorate large masses of it in a tubular shape, in a very few minutes after the application.—Mc.]

‡ [I have repeatedly yielded to the urgent solicitations of my friends in consultation, and performed the operation of tracheotomy under the most desperate circumstances of croup, but never with more than temporary relief. The diameter of the trachea is too small in young children, especially when diminished by inflammatory thickening and deposition, to admit of the successful introduction of any instrument to maintain the respiration. The subsequent profuse secretions always produce suffocation. Moreover, the effects of the original inflammation extend below the reach of an operation in most cases.—Mc.]

Sect. IV.—*Acute Bronchitis.*

Peripneumonia Notha.

The pathological character of acute bronchitis is very closely allied to common catarrh; and, in truth, the latter affection may be regarded as the lowest grade of mucous inflammation of the bronchia. (Hastings.) This form of pneumonic inflammation is most apt to attack old people and infants, or persons of phlegmatic and debilitated habits. It generally commences like ordinary catarrh, with lassitude, chilliness, slight cough, and a sense of oppression and tightness about the præcordia. In many instances, the disease seems at first of no very serious character. The patient complains of little or no pain in the breast—a sense of weight and constriction in the thorax being the only uneasiness experienced in that part. In these cases, the febrile symptoms are but moderate. As the disease continues, the oppression at the præcordia increases; the countenance becomes expressive of anxiety; respiration becomes more and more laborious; and is attended with a wheezing rattling sound, as if the air were forced through a narrow aperture clogged with a viscid fluid. In most instances there is some degree of hoarseness. In the advanced period of the disease, respiration is much more difficult in the recumbent than in the erect position; and hence patients generally desire to have the head and shoulders propped up with pillows. At first the cough is dry; but a copious secretion of viscid transparent mucus, resembling the white of eggs, soon takes place, and with it considerable abatement of the violence of the cough occurs. So long as the sputa preserve this appearance, the disease may be regarded as unchecked in its violence; but when the inflammation is about to terminate in resolution, the matter expectorated loses its transparency, "and becomes mixed with yellowish-white or greenish masses, which are scanty at first, but continue to increase more and more, until at last they compose the whole of the expectoration."* In nearly every instance of the disease, severe pain is felt across the forehead, which is always greatly aggravated by coughing. When the secretion of mucus into the bronchia is very copious, and respiration much obstructed, considerable drowsiness usually occurs. The tongue is white, and covered with transparent mucus; the skin is dry, and its temperature generally but very little above the natural standard. The blood is commonly buffy, and sometimes cupped. Infants are especially liable to this affection. In them the disease manifests itself by a short, quick, oppressed and wheezing respiration; uneasiness by being placed in the recumbent position; slight cough, somewhat hoarse at first, but humid and rattling as the disease advances; *a uniformly pale and anxious countenance;* pulse frequent and tense; skin above the natural temperature on the trunk—but the hands and feet are commonly cool, or about the regular temperature. Respiration varies greatly: occasionally it is easy and free—and then suddenly becomes alarmingly oppressed, threatening instant suffocation. The progress of the disease is usually rapid. If it be not arrested, the breathing becomes more and more oppressed; "the child falls into a comatose state; a slightly livid tinge makes its appearance on the lips, from which the pallid cheeks are not entirely free. But even at this late period, gleams of hope sometimes burst upon us. For a short time the difficulty of respiration may seem to subside, and the child to be better. But these hopes are very seldom realized; for even the next exacerbation may terminate in suffocation." The disease sometimes terminates fatally as early as the third day, though more commonly its course is protracted to the fifth or sixth day. Acute bronchitis is always attended with great muscular debility.

In robust plethoric subjects, the febrile reaction in the early period of its

* Clinique Médicale, &c. Par G. Andral Deuxième partie, p. 63.

course is sometimes as vehement as in pleuritis. In cases of this kind, the inflammation generally passes to the substance of the lungs. Little or no pain, however, is felt in the breast; but the tightness and oppression are extremely distressing, and the breathing very laborious. Unless the inflammation be promptly subdued, effusion into the bronchial cells will take place; the lips become purple; the face and extremities cold; the pulse small, laboring and obstructed; the breathing short and incomplete; and at last drowsiness, partial coma, and suffocation close the scene.*

In some instances, acute bronchitis is complicated with *hepatic* disease; a complication which occurs, not unfrequently, in persons addicted to the intemperate use of spirituous liquors. (Hastings.) Cases of this kind, besides the pneumonic symptoms already mentioned, are attended with tenderness and fullness of the right hypochondrium, oppression in the præcordia, nausea, bitter taste, vertigo, headache, dark-colored and very fetid alvine discharges; and in some instances symptoms of acute hepatic inflammation attend, more especially when the bronchitis occurs after measles. In children, cynanche trachealis often terminates fatally by the supervention of acute bronchitis.

Diagnosis.—The characteristic symptoms of acute bronchitis are: great oppression and tightness in the breast, with little or no pain; severe pain in the forehead, greatly aggravated on coughing; a wheezing rattling respiration; uneasiness in the recumbent position; pallor of the countenance; a very copious secretion of viscid, frothy, and transparent mucus in the bronchia;† and generally a moderate grade of febrile excitement.

Post-mortem appearances.—In very acute and rapid cases, the lungs do not collapse on opening the thorax, and its whole structure appears to be engorged with a frothy serous fluid. The mucous membrane is generally minutely injected—sometimes throughout its whole extent, and occasionally only in patches, the intermediate parts being nearly in a natural state. The smaller branches of the bronchia are usually filled with a tenacious mucus, bloody serum, or purulent matter. In acute bronchitis succeeding pustular exanthematous affections, minute ulcerations, with uniform redness of the mucous membrane, frequently occur. In many instances, the substance of the lungs exhibits a reddened, hepatized, suppurated, or tuberculated structure; and occasionally even the pleura is found inflamed with incrustations of false membrane, or effusion into the cavity of the thorax.‡

The wheezing respiration, and the great difficulty of breathing in this affection, are caused, no doubt, says Dr. Hastings, by the mechanical impediment to respiration from the redundant viscid mucus lodged in the smaller branches of the bronchial tubes; and the severe headache arises probably from "the congestion of the pulmonary blood-vessels," interfering with the due return of blood from the head. Deficient decarbonization of the blood would seem to be the cause of the great muscular prostration which always attends severe cases of this disease.

Although the phenomena just mentioned are very generally presented on dissection, I do not doubt that death sometimes occurs in consequence of the inflamed mucous membrane preventing the atmospheric air from producing the necessary change in the venous blood. M. Andral, jun., has related some cases of mortal dyspnœa from bronchial inflammation, where no effusion had taken place, nor any lesion of the parenchymatous structure of the lungs. When the pulmonary mucous membrane is intensely inflamed, the necessary influence of the atmospheric air upon the blood, it may reasonably be presumed, will be more or less diminished; for it can scarcely be doubted, that whether the oxygen

* A Treatise on Inflammation of the Mucous Membrane of the Lungs. By B. C. Hastings.

† M. Andral says this mucus resembles the white of eggs, and is extremely tenacious. Its tenacity and viscidity increase in proportion as the irritation of the mucous membrane is more considerable.

‡ Hastings, loc. citat., p. 186.

enter into the blood-vessels, or the carbon be thrown out through the delicate mucous membrane, much impediment will be produced to this process, when this membrane is deeply inflamed and thickened. The dyspnœa occurring in the early stage of bronchitis, is, perhaps, mainly attributable to this cause, and not to the clogging of the bronchial cells by viscid mucus, as is generally supposed. Patients often die in this disease, it would seem, from asphyxia—the inflamed mucous membrane opposing the transit of the carbon from the blood to the bronchial cells, or of the oxygen of the air into the circulation.

The *prognosis* in this affection is generally attended with much uncertainty; for in cases which appear to be going on without any particular danger, a sudden exacerbation will sometimes occur, and speedily terminate the patient's life. Death, in this disease, is almost always preceded by more or less coma, and occurs, generally, from effusion taking place into the substance of the lungs and bronchial cells. A copious expectoration is always a favorable sign in this, as in the other varieties of pneumonic inflammation. The less thoracic oppression and dyspnœa there are, the greater will be the chance of recovery from this disease.

Treatment.—Much discrepancy of opinion has been expressed with regard to the value of blood-letting in this affection—some considering this evacuation as attended with much risk, on account of the great tendency to prostration and effusion into the lungs connected with the disease, (Richter,) whilst others rely, with much confidence, on prompt and decisive blood-letting. With proper discrimination, the abstraction of blood may be as beneficially resorted to in this, as in any other form of pneumonic inflammation. In the acute bronchitis of very old persons, or of worn out and debilitated habits, it is, indeed, necessary to proceed with much caution in the use of the lancet; but even in cases of this kind, moderate bleeding, soon after the commencement of the disease, will in most instances prove serviceable. In infants, when I have been called early, I have almost uniformly resorted to one very decisive bleeding; and generally, with unequivocal advantage. In the rapid and violent instances which occur in robust, vigorous and plethoric habits, prompt and very efficient bleeding is indispensable. In all cases, however, and particularly in the latter variety, the blood should be taken at an early period—as soon after the development of the inflammation as possible. If delayed until effusion or a copious secretion of bronchial mucus has taken place, the chance of benefit from it will be greatly diminished, and detriment probably be the consequence. So long as the cough is dry, we may draw blood, with a fair prospect of advantage; and a sufficient quantity ought to be taken away, at the first bleeding, to make a manifest impression on the action of the heart and arteries; for a repetition of it will seldom be borne more than once or twice.

Cathartics are recommended by some writers, but, except in the very commencement of the complaint, they are of doubtful propriety. The bowels should be kept in a loose state by laxative enemata, or the exhibition of the milder aperients, such as castor oil, or small portions of one of the laxative neutral salts. When, however, the disease is complicated with abdominal disease, cathartics may be freely employed with much advantage.

Emetics are generally recommended as among the most useful remedies in this affection. They usually procure immediate relief of the oppression in the chest and dyspnœa; and are apt to excite general diaphoresis, as well as more free expectoration. In the bronchitis of infants, they are especially serviceable, by expelling the viscid mucus which clogs the bronchial cells, and thus facilitating respiration, and thereby sustaining the powers of the system. Hastings observes, that an aqueous solution of tartar emetic is the best medicine for this purpose in adults; and ipecacuanha in children. I have generally preferred using a mixture of vinum antimonii and syrup of squills, in children laboring under this complaint. From fifteen to twenty drops of the former, with half a

teaspoonful of the latter, may be given every twenty minutes to a child from one to three or four years of age, until vomiting is produced.

Expectorants also are useful remedies in this affection. In the early period of the disease, mucilaginous mixtures, or antimonials, should be employed for this purpose. Thus:

℞.—Tart antimonii grs. ii.
Sal. tartar. ʒvi.
Aq. fontanæ ℥iiss.
Mel. optim. ℥iiss.—M. ft. S. A tablespoonful every hour for an adult.

But after the general arterial excitement has been moderated, we may resort with much advantage to the stimulating expectorants.

℞.—G. ammoniæ ʒi.
Infusio polygal. seneg. ℥viij.
Oxymel. scill. ℥i.—M. ft. S. A tablespoonful every two hours for an adult.

When the pulse becomes very small and weak, some of the more active stimulants should be exhibited along with the expectorants. For this purpose, camphor and the carbonate of *ammonia* are valuable. I have used the following mixtures with much benefit in cases of this kind:

℞.—Pulv. camph. ℈ii.
—— g. Arab. ʒii.
Syrup. scillæ ℥i.

Triturate them in a mortar; then gradually add,

Aq. fontanæ ℥vi.
Tinct. opii gtt. lx.—M. S. Take a tablespoonful every hour or two.

Or,

℞.—Carbon. ammoniæ ʒii.
Extract. glycyrrh. ℥ss.
Aq. fontanæ ℥viij
Acid. scillæ ℥ss.—M. S. Take a tablespoonful every hour or two.

In instances of this kind, Hoffman declares, that the following combination has often, in his hands, afforded complete relief in cases apparently hopeless:

℞.—Flor. benzoes grs. iv.
P. camphor grs. ii.
Sacchar. alb. ℈i.—M. This dose to be taken every two hours.*

Opium cannot in general be given with propriety in this affection, after the bronchial secretion is fully established. By its tendency to suspend for a time the efforts to expectorate, it may readily give rise to dangerous accumulations of mucus in the bronchial tubes. When the cough is dry, however, and the arterial reaction has been moderated by depletion, the judicious employment of this narcotic will often procure much relief. "In combination with small doses of calomel, opium may sometimes be beneficially exhibited at an *early* period of the disease. When conjoined, these remedies not only diminish the cough, and assist expectoration, but seem likewise to regulate the secretion in adults." (Hastings.) In the bronchitis of old people I have given opium and calomel in the proportion of half a grain of the former to two grains of the latter, every three or four hours, with much benefit in the early period of the disease. In very young children, however, opium is always to be used with the greatest caution.

External irritating applications to the thorax are highly important means in the cure of this disease. Immediately after blood has been efficiently abstracted, a blister should be applied over the anterior surface of the chest, and the surface kept discharging, by some irritating ointment. In children, much benefit usually results from the application of *leeches* to the chest after general bleeding. Leech-

* Richter's Specielle Thérapie, b. i. p. 424.

ing, indeed, constitutes a primary remedy in this affection, and ought always, if possible, to be practised. In many instances, I have known immediate and very great relief obtained from the local abstraction of blood in this way. A large emollient poultice should be applied after the leeches have been removed; or a blister may be laid over the breast, and suffered to remain until the skin is inflamed, and then replaced by a poultice. The warm bath may also be used with a good effect, where the skin is dry and harsh.

A regulated temperature of the atmosphere in the patient's chamber is of no small degree of importance in the management of this disease. The air of the room should be kept comfortably and *uniformly* warm, so as to favor the action of the cutaneous exhalents.* Low or sudden variations of temperature are extremely apt to have a prejudicial influence in this affection.

During the debility, which generally remains after the disease has been subdued, benefit will often be derived from mild and nourishing diet, and the use of weak infusions of colomba, gentian, &c.

Sect. V.—*Chronic Bronchitis.—Bronchial Consumption.*

Chronic inflammation of the mucous membrane of the bronchia, is an affection of very frequent occurrence in cold and variable climates. In its simplest form it constitutes those protracted catarrhal affections which are common during winter in old persons, and in such as are predisposed to pneumonic irritation. Cases of this kind generally commence with the cold weather, and continue to the end of winter. They are characterized by a troublesome cough, attended with copious expectoration of a viscid muco-purulent, or a whitish frothy matter; uneasy and somewhat oppressed respiration, accompanied at times with wheezing; more or less weight and uneasiness in the epigastrium; loss of appetite; a slightly furred tongue; irregular action of the bowels; a quick and irritated pulse, particularly towards evening; and deep red and scanty urine. The coughing usually occurs in fits of considerable violence, being generally most severe in the morning on arising from bed, or on passing from a warm to a cold air. Sudden atmospheric vicissitudes, also, seldom fail to increase the violence and frequency of the spells of coughing; and the same effect is usually produced by the inhalation of irritating vapors, fine dust, smoke, and occasionally by the act of swallowing food. Slight transient pains are, at times, felt in the chest; frequently, however, no painful sensations whatever are experienced, except immediately after a fit of coughing, when a general aching pain is felt for a few moments in the breast.

There is another variety of chronic bronchitis, which, in its general phenomena and effects upon the system, bears so close a resemblance to tubercular phthisis, that it is not unfrequently mistaken for this latter affection—and which is described by authors, under the name of

Catarrhal Consumption.

A large portion of the cases usually regarded as true tuberculous consumption, consists of instances of chronic bronchitis; and as a correct diagnosis between these two affections is of much practical consequence, it is especially important that particular attention be paid to the distinctive phenomena and pathological conditions of the present malady. This, as well as the former variety of bronchitis, is the consequence generally of neglected catarrh; and it occurs occasionally as the result of an acute attack of bronchial inflammation. At first, the symptoms resemble those of ordinary catarrh—the expectoration being viscid, thick, and opaque, but not yellow, containing small lumps of a firm or viscid,

* Broussais, Histoire des Phlegmasies Chroniques, tom. i. p. 149.

grayish, translucent mucus, which sink in water. Mixed with these sputa, we sometimes find small membranous or flaky substances, which float on the surface of water. (Hastings.) As the disease advances, this viscid mucus becomes more and more mixed with a yellowish opaque fluid, resembling pus, and often slightly streaked with blood. In many instances, the expectoration, at last, acquires a whitish opaque appearance, resembling cream, and sometimes a uniformly greenish-yellow color, which readily sinks in water. At first, the pulse becomes slightly accelerated and tense towards evening; and the heat of the surface varies in the course of the day, being sometimes above, and, at others, below the natural standard. Partial sweats, about the head and breast, occur during the night. The thirst is generally considerably increased; the urine is high-colored, and deposits a copious reddish sediment on cooling. A sense of soreness in the chest, with an occasional transient stitch in the side, is felt in the majority of instances; but there is rarely any *fixed* pain in the thorax. The cough is usually severe—particularly on rising out of bed in the morning, at which time the respiration is more or less wheezing, accompanied with a feeling of tightness in the breast. If the disease continue unchecked in its course, the expectoration becomes at last purulent and extremely copious. Debility and emaciation proceed rapidly, and the difficulty of breathing, and sense of weight and tightness across the chest, become more and more distressing. The pulse is now generally very frequent, being seldom under one hundred and twenty in a minute. In the early part of the day the face is usually pale, but a deep flush on one or both cheeks is commonly observed during the evening febrile exacerbations. The tongue becomes clean, and in many instances "it assumes a shining appearance, and is redder than in health." Profuse and exhausting night-sweats generally occur at this advanced stage of the disease; and towards the termination of fatal cases, colliquative diarrhœa, and œdema of the ankles, supervene as in tubercular phthisis pulmonalis. Indeed, in the latter stages of the disease, it is generally difficult, if not impossible, to distinguish it with certainty from tubercular consumption; nor is it less fatal in its tendency after it has advanced to this stage, than genuine pulmonary consumption. When chronic bronchitis is complicated with *hepatic* disease, an occurrence by no means uncommon, it forms what authors have termed "*dyspeptic consumption.*" In this variety of the disease we have, in addition to the ordinary phenomena of chronic bronchial inflammation, various symptoms indicative of hepatic disorder—such as tenderness and tension in the epigastrium and right hypochondrium; irregularity of the bowels with unnatural stools; a sallow hue of the skin, and yellowness of the conjunctiva; flatulency; indigestion, with variable appetite; increased dyspnœa, and cough after taking hearty meals; furred and brown tongue; foul breath; and occasional nausea or vomiting. In some instances of this variety of bronchitis, no symptoms indicative of pulmonic affection occur in the commencement of the malady, the only manifestations of disease being such as are usually present in liver affections. A dull pain or tenderness in the right hypochondrium, with increased uneasiness by lying on the left side; irregularity of the bowels; foul tongue, and depression of spirits, are, in such cases, the first symptoms complained of by the patient. "The first warnings of disease in the bronchial membrane are slight. There is a dry cough, unattended with any pain. By degrees the cough becomes more troublesome, and when it continues for some time, a tenacious mucus is expectorated. The breathing, too, is in some degree affected, and the patient complains of weight and tightness across the chest." The bronchial affection now advances with more or less celerity, until a copious purulent expectoration, and the usual symptoms of hectic, are fully established.*

Diagnosis.—The following diagnostic circumstances between chronic bronchitis, in the early period of its course, and tubercular phthisis, will, in general,

* A Treatise on Inflammation of the Mucous Membrane of the Lungs, &c. By Charles Hastings, M.D., p. 277.

enable us to distinguish these two affections from each other. In chronic bronchitis the face is generally pallid, and the lips of a bluish hue. In tubercular phthisis the lips are red, and the cheeks more constantly flushed. "In the beginning of chronic inflammation of the bronchia, the hands and feet are often cold, and the temperature of the surface altogether more variable than in tubercular consumption." More or less inflammation and soreness usually occur in the upper portion of the pharynx, during the early period of chronic bronchitis, which is very rarely the case in tubercular phthisis. In the former affection the expectoration is free almost from the commencement, and continues to be blended with a large portion of transparent viscid mucus to the end of the disease.* In tubercular consumption, on the other hand, the cough is for a long time short and dry. Chronic bronchitis is attended with much more oppression in the chest, and wheezing respiration, though less pectoral pain, than true pulmonary phthisis.† The paroxysms of hectic fever are much less regular in chronic bronchitis than in tubercular phthisis. Besides these diagnostic indications, the presence or absence of the ordinary signs of a scrofulous habit, as well as the origin and general progress of the disease, will, in general, aid us considerably in discriminating these two affections. In its commencement and early stage, chronic bronchitis is usually much more distinctly inflammatory than scrofulous phthisis. It should be remarked, however, that these two forms of pulmonary disease may exist simultaneously; and phthisis pulmonalis is, in fact, not unfrequently associated, in its advanced periods, with chronic mucous inflammation of the bronchia.

Post-mortem Appearances.—On opening the thorax the lungs do not collapse; the capillaries of the mucous membrane are dilated and strongly injected, giving, in some instances, an appearance to this membrane, as if it were composed of a congeries of vessels. (Hastings.) This membrane is generally considerably thickened, and in many cases it is found ulcerated in different parts of its extent. The bronchial cells are usually much engorged with purulent matter, mixed with a bloody serous fluid, and a portion of frothy mucus. In some cases the bronchial membrane is covered with numerous minute pimples or eminences, bearing some resemblance to pustules. (Armstrong.) Sometimes the inflammation is found to have extended from the mucous membrane to the surrounding cellular and pulmonary structures; and sometimes the submucous cellular texture exhibits only a state of redness and vascular congestion; whilst in other instances, this structure is condensed and elastic by the deposition of lymph into its interstices. When the inflammation has extended to the substance of the lungs, we usually find it somewhat hard and dense, with loss of its natural elasticity and compressibility. (Badham.) In some cases the pleura is thickly sown with minute tubercular depositions, showing that the diseased excitement had extended itself to this membrane. Broussais states, that in the fatal cases of chronic bronchitis among the soldiers of the French army, induration of the substance of the lungs was almost a universal pathological phenomenon;‡ and he ascribes the great frequency of this disorganized state of the pulmonary structure to the exposure of the soldiers to wet and inclement weather, while in a state of debility and privation. He states that more or less extensive portions of the parenchymatous substance of the lungs were almost always found in a state of red hepatization, interspersed with softened and broken-down parts, as if putrefaction had taken place in these points.

Causes.—Chronic inflammation of the mucous membrane of the bronchia may

* "Early in the disease," says Dr. Hastings, "the absence of pain during inspiration; the capability of resting on either side in bed, (when there is no abdominal disease;) the wheezing noise in respiration; the leaden color of the lips, and the pallidity of the countenance; the appearance of the sputa, consisting almost entirely of mucus, occasionally streaked with blood, are symptoms sufficiently well-marked to distinguish chronic inflammation of the bronchia from tubercular phthisis."—*Loco citat.*, p. 290.

† Dr. Armstrong on Consumption, &c.

‡ Phlegmasies Chroniques, tom. i. p. 144.

occur as the sequel of acute bronchitis. *Most commonly, however, it arises from neglected catarrh.* It is the consequence sometimes of measles; of hepatic disease; and of protracted disorder primarily located in the digestive organs. It may also proceed directly from the influence of atmospheric inclemency and vicissitudes of temperature; and from the inhalation of irritating vapors or particles of matter floating in the atmosphere—a common source of the disease among stone-cutters, needle-grinders, millers, &c. It occasionally occurs, also, in consequence of hooping-cough—particularly from taking cold while under the influence of this affection.

Treatment.—The principal indications to be kept in view in the treatment of chronic inflammation of the mucous membrane of the bronchia, are:—1, to diminish the morbid excitability and excitement of the sanguiferous system; 2, to lessen the determination to, and derive the circulation from, the inflamed mucous structure of the lungs; and 3, to correct the functional derangement of the skin, liver, and alimentary canal.

In the early stage of the disease, the activity of the pulse will sometimes call for moderate general bleeding; but this evacuation can seldom be often repeated, even in moderate quantities, without the risk of doing injury by its tendency to increase the general irritability and weakness which attend this affection. Where the general phlogistic excitement indicates the propriety of bleeding, it will always, perhaps, be better to trust to occasional leeching or cupping. After the disease has assumed the character of phthisis, the abstraction of blood may be regarded as very generally altogether improper.

From the intimate sympathetic relation which subsists between the skin and the lining membrane of the bronchia, it is of great importance in the treatment of this affection, to keep up a regular action of the cutaneous exhalents; for, in proportion as we increase the activity of these emunctories, so do we, in general, lessen the afflux of the fluids to the lungs. For this purpose, the patient should be directed to wear flannel next to the skin, and to protect himself by proper clothing against the influence of cold and atmospheric vicissitudes. An equable and mild temperature will generally contribute greatly to the successful management of this disease. No remedial treatment can procure a permanent advantage in this complaint, when the patient is much exposed to a damp, variable, and inclement atmosphere. If the patient's situation or circumstances do not admit of his visiting warm and uniform climates, he should remain in his chamber—the air of which must be kept at a comfortable and regular temperature, during the cold and variable seasons of the year. When the weather is mild, exercise in the open air will, in general, prove salutary in this affection.

External irritating applications to the breast, are among our most useful means for combating this disease. Blisters may be employed for this purpose; but pustulation by frictions with tartar emetic, or with precipitate ointment, will produce a more permanent, and, in general, a more efficient counter-irritation. Setons, or caustic issues, are much recommended by some writers; but their good effects are not equal, I think, to those which may be derived from more extensive irritation. Broussais recommends the application of large emollient poultices over the breast. He asserts, that he has cured inveterate cases of catarrhal inflammation by the continued use of poultices of this kind. They are to be preferred to blisters, he says, in nervous, irritable, and plethoric patients. I have myself known great benefit to be derived in delicate and nervous persons affected with this disease from emollient poultices to the breast. After the skin has been pustulated by tartar emetic ointment, poultices of this kind should be kept applied over the breast until the pustules are entirely healed. In the milder variety of chronic bronchitis described above—that is, in those chronic catarrhal affections which are apt to occur in old persons during the winter, mild emetics have been found useful by dislodging the viscid secretions with which the bronchial cells become engorged: but their beneficial effects are generally only palliative. To moderate the general irritability of the system, and the velocity of the circulation,

digitalis may be advantageously employed. In the advanced stages of the disease, when the expectoration has acquired a purulent character, I have known considerable benefit to be obtained from the use of digitalis and tinct. of the balsam of tolu, according to the following formula:

℞.—Tinct. digitalis ℥ss.
—— tolutani ℥i.—M. S. Take a teaspoonful three times daily.

At an earlier period of the disease, small doses of digitalis in union with pulvis antimonialis, will sometimes prove serviceable, by lessening the momentum of the circulation, and sustaining the regular action of the cutaneous exhalents.

Dr. Hastings speaks very favorably of the effects of squills in the advanced stage of this complaint—more especially in those cases which assume the character of chronic cough. I have used this article, in combination with the seed of *phelandrium aquaticum*, with much benefit in a considerable number of cases. I usually order it thus:

℞.—Sem. phelandr. aquat. ʒiss.
Pulv. scillæ grs. xii.
Pulv. opii grs. ii.—M. Divide into eight equal parts. S. Take one three times daily.

The *phelandrium* is much extolled by some German writers as a remedy in this disease.

The use of the tincture of colchicum is recommended by some in the treatment of this affection. Hastings observes that he has found it to allay the cough, promote the expectoration and flow of urine, and keep up a regular action of the bowels. It may be used, he says, where squills, from their greater tendency to excite the sanguiferous system, are inadmissible. From twenty to thirty drops may be given three times daily. I have, in a few instances, known this medicine, in union with the tincture of belladonna, to produce excellent effects in this disease. Twenty drops of the former may be given with from thirty to forty drops of the latter thrice a day.

Some of the vegetable balsams have of late years been particularly recommended in chronic inflammation of the bronchia. Of these, the balsam copaiva is decidedly the most useful. Dr. Armstrong observes, that this article "seems, in many cases, to exert a specific influence over the mucous membrane of the trachea and its branches; it increases the flow of urine, generally keeps the bowels regularly open, and sometimes excites a peculiar itching of the skin. At first, it should be given in doses of from thirty to forty drops three times a day, and gradually increased afterwards to sixty or eighty drops at each dose." I have myself used this article with prominent benefit in the advanced periods of the disease; but in many instances, little or no apparent benefit resulted from its use; and, in a few cases, it was evidently injurious, both by weakening the tone of the digestive organs, and by increasing the general febrile irritation. Morgagni employed this balsam in conjunction with sulphur in chronic catarrhal affections; and Armstrong asserts that he has given this combination with unequivocal advantage in the present disease. I have usually given the balsam according to this formula:

℞.—Sodæ supercarbonat. ʒiss.
Vitel. ovor. No. iii.
Sacch. albi ℥ss.
Bals. copaib. ʒvi.
Aq. fontanæ ℥viij.
Tinct. opii gtt. lx.—M. S. Take a tablespoonful three times daily.

Armstrong has found an emulsion of the spirits of turpentine very efficacious in this disease; but its powers are too irritating to admit of employment in the ordinary cases of the disease.

The *Peruvian bark* has been found a useful remedy in this affection, when the night-sweats are profuse and the general debility considerable. Given with diluted sulphuric acid in such cases, its beneficial effects, says Dr. Hastings, are sometimes very evident. It tends to restrain the debilitating night-sweats, and

"to alter the secretion from the mucous membrane of the lungs." In chronic bronchitis succeeding hooping-cough, I have used the sulphate of quinine with marked advantage. In several instances of this kind, I gave this article in union with the extract of *conium* with the happiest effect.

Opium is often decidedly beneficial in this disease. Given in combination with ipecacuanha, or in the form of Dover's powder, it always procures great temporary relief, and may materially assist other remedies in the reduction of the bronchial inflammation. It is inadmissible, however, so long as there is much febrile irritation; but in the advanced period of the disease, particularly in the chronic bronchial inflammation of old or debilitated subjects, where the system is irritable and the cough frequent and troublesome, six to eight grains of Dover's powder, given in the evening, will suspend the cough and procure comfortable rest during the night. The extract of conium or hyoscyamus with ipecacuanha, may also be usefully employed, for the purpose of allaying the general irritability and cough, and improving the character of the expectoration. The same intentions will, in general, be answered by full doses of *lactucarium*. This article is particularly recommended by Dr. Duncan, in the management of pulmonary affections. It may be used with benefit in instances where opium, from its constipating effects, or other disagreeable consequences, is inadmissible. The dose is from two to three grains.

The *prussic acid* has been employed with benefit in this affection. From its powerful tendency to reduce the general excitability of the system, it is, without doubt, well calculated to do good in this complaint. Its variable and dangerous activity, however, renders it an extremely precarious and hazardous remedy. I have known a few instances in which considerable relief was obtained from this medicine: but in the majority of cases no advantage was derived from it; and in two it produced alarming prostration. It may be given according to this formula:*

℞.—Acid. hydrocyanici gtt. viij.
Mucilag. g Arab. ℥ss.
Sacch. albi ʒij
Aq. fontanæ ℥viij.—M. S. Take a tablespoonful every three or four hours.

In the first edition of this work, I omitted, through inadvertence, mentioning the *sugar of lead* as a remedy in chronic bronchitis, attended with hectic.—From my own experience with this article, I am entirely persuaded, that it will more generally afford relief in this affection, than any other remedy we possess. When the expectoration is copious, and the night-sweats profuse, it rarely fails to moderate and improve the former, and to check the latter evacuation. In most instances, too, it exerts a manifest controlling influence over the febrile irritation. Indeed, I am persuaded, that the powers of the *sugar of lead* as a remedy in this form of consumption, are not sufficiently known to the profession in this country. In Germany it has long since been used by many eminent practitioners, as a favorite remedy in this affection. Osiander speaks in the most favorable terms of its powers in this respect. He asserts that it is not only an excellent and prompt palliative, but the most certain means for effecting a cure we possess.† Hildebrandt also strongly recommends its use in this disease.—There is a very remarkable case of what is called *blennorrhœa pulmonum* related in Horn's *Archives*, which was radically cured by the internal use of this remedy.‡ In France, M. Fouquier has been long in the habit of prescribing this article in consumption, and his confidence in its salutary powers appears to be very great. He asserts that the sugar of lead may be regarded as a *specific remedy* for the profuse night-sweats of hectic. It must be observed, that although

* The deleterious effects of the prussic acid may be speedily counteracted by a full dose of the aq. ammonia, or of a solution of the carbonate of ammonia.

† Osiander, Entwickelungskrankeiten des weiblichen geschlechts.

‡ Archiv. d. Pract. Med., b. 4, hf. 2, s. 287.

a valuable means for checking the copious sweats in every variety of consumption, the sugar of lead cannot be expected to procure any permanent or radical benefit, or effect a cure in tuberculous phthisis, or in any form of this disease attended with structural lesion of the lungs. In that variety of consumptive disease, however, which depends solely on chronic inflammation of the mucous membrane of the lungs—and in which the expectoration of puruloid matter is generally very copious, a well-regulated use of this remedy not unfrequently contributes very greatly to the complete restoration of health. Within the present year, I succeeded in curing a case of this kind—attended with all the usual symptoms of fully-developed phthisis, in a child about five years old, by the use of the sugar of lead. This case was the consequence of hooping-cough—a disease which not unfrequently terminates in chronic bronchitis. The best mode of using this article, in the present affection, is to give it in union with Dover's powder, or with the extract of hyoscyamus. One grain of the lead with four grains of Dover's powder, or two grains of the extract of hyoscyamus, should be given three times daily. The quantity of the lead must be gradually increased, until it amounts to three or four grains at each dose. It is a fact, pretty generally known, that the sugar of lead very rarely produces colic. Osiander declares that, in the course of thirty years' practice, during which he prescribed it in several hundred cases, it never gave rise to any injurious consequences.*

The inner bark of the *ampelopsis hedra* has been employed with great advantage in the advanced stage of chronic bronchitis. It is given in decoction, in the proportion of an ounce of the bark to a pint of boiling water—of which a wineglassful is to be taken four times daily.† In a single instance in which I have lately used this article, I obtained marked benefit from it. The cough gradually declined, the expectoration became improved and diminished, and the general irritation of the vascular system subdued.

The bark of the *white willow*, in the form of powder, formed into an electuary with sulphur and honey, was employed with much success by Dr. Kerckhoff, in the last stage of consumption from chronic inflammation of the mucous membrane of the bronchia.‡ The root of the *actea racemosa* has been employed by some American physicians in chronic pulmonary affections. I have had some experience with this article in the treatment of chronic inflammation of the mucous membrane of the lungs; and its effects have appeared to me beneficial in several instances. I have found it to diminish the velocity of the circulation, and to render the expectoration less copious and of a more natural appearance. It is given in decoction in the proportion of an ounce of the root to a pint of water. A tablespoonful of it is to be taken every four hours during the day. Its operation is slow, and requires protracted use to obtain any particular advantage from it.

When chronic bronchitis is complicated with hepatic disease, mercury must be used in conjunction with the other remedies employed for the bronchial affection. Small doses of blue pill should be given until the gums are very slightly inflamed; and this degree of mercurial action must be sustained so long as there is any tenderness in the right hypochondriac or hypogastric regions, and the alvine evacuations indicate deficient or vitiated biliary secretion. I have used the following pill with peculiar benefit in this modification of the disease:

℞.—Massæ hydrarg. ʒi.
Aloes socot. ℈i.
Tart. antimonii grs. iij.—M. Divide into thirty pills. Take one every morning and evening.

In some instances, *calomel* will agree much better with the stomach than the blue pill—the latter giving rise to general irritation and more or less gastric dis-

* Casper's Characteristik der Französischen Medicin., p. 239.
† See Dr. Atkin's paper in the Philadelphia Med. and Surg. Journal, October, 1826.
‡ Transact. of Lond. College of Physicians, vol. vi.

turbance. When calomel is used, it should be given in very small doses, and may be advantageously combined with the extract of conium.

Sulphur was formerly much employed in chronic pulmonary affections of this kind. In chronic catarrh, attended with a puruloid expectoration, I have known much benefit derived from Englehard's mixture.*

Of late years a great deal has been said of the inhalation of the fumes of tar, in the treatment of chronic inflammation of the mucous membrane of the lungs. That this remedy has been employed with some success in this complaint, the testimony published by men of eminence and respectability does not permit us to doubt. It appears to be now generally admitted, however, that its powers are by no means so salutary as was first asserted. Hastings states "that in chronic bronchitis the inhalation of tar-fumes seems to assist other remedies in restoring the mucous membrane to its healthy secretion; and in some very obstinate cases, the inhalation alone has appeared to remove the diseased action in the mucous membrane of the lungs. In other instances, the inflammation has been aggravated and rendered acute by it. When the habit of the body is irritable, and the inflammation at all active, the symptoms are increased by its use; but if the disease has been long in a chronic state, and the habit of body not irritable, relief may be expected from it." I have employed this remedy in perhaps a dozen cases; in a few instances I found it particularly beneficial, though generally it failed to do any good whatever. The fumes of *resin* have also been recommended in the present complaint. A few pieces may be thrown upon hot coals on a shovel, and brought near the patient, so as to cause him to inhale the fumes. The *tar* is used by placing it in a dish over hot coals, and suffering it to evaporate slowly, until the air of the patient's chamber is well impregnated with the fumes. If the cough and dyspnœa are aggravated by these inhalations, which frequently happens, they must be discontinued.

The inhalation of powdered vegetable substances, dispersed in the air breathed by the patient, has been used with marked benefit in the phthisical stage of chronic bronchial inflammation. Dr. Darwin mentions the inhalation of the dust of cinchona as having afforded relief in chronic pulmonary complaints. I have known the inhalation of the dust of oak bark effect a complete cure in an instance of chronic bronchitis.

Sect. VI.—*Phthisis Pulmonalis.*

Pulmonary Consumption.

The assemblage of morbid phenomena, usually designated by the term *consumption*, may arise from various pathological conditions of the respiratory organs, which, in a practical point of view, it is of much consequence to discriminate from each other. Thus, the symptoms by which physicians are in the habit of recognizing the presence of consumption may depend: 1. On chronic inflammation of the mucous membrane of the bronchia; 2. On ulceration and chronic inflammation of the larynx or trachea; 3. Chronic inflammation of the pleura; 4. Inflammation and the formation of vomica, or abscesses in the parenchymatous substance of the lungs; 5. Ulceration of hepatized lungs; 6. Ulceration with melanosis; 7. Infarction of the lungs with morbid cartilaginoid granulations; and, 8. Softening of tuberculous matter in the lungs, with more or less chronic inflammation and disorganization of the pulmonary tissue.

Of the first of these varieties of pulmonary disease, I have already treated in the preceding section, under the head of *chronic bronchitis;* and this, the catarrhal

* ℞.—Extract. hyoscyam.
Flor. sulph.
Extract. glycyrrh., āā ʒi.—M. Of this mixture eight grains are to be taken three times daily.

or pituitous consumption of authors, constitutes, probably, the majority of the reputed cases of phthisis pulmonalis in cold and variable climates.

1. *Laryngeal and tracheal Consumption.*—Ulceration of the *larynx* or *trachea* gives rise to what is termed *laryngeal* or *tracheal* consumption, a variety of phthisis which is generally rapid in its course, and always of a most fatal tendency.

Tracheal and laryngeal consumption usually begins with a slight tickling cough, and obscure feeling of uneasiness or pain in some part of the trachea or larynx; occasional oppression of breathing, and slight febrile irritation in the evening. One of the first and most constant symptoms of this variety of the disease is *a change of the voice;* which becomes indistinct, hoarse, feeble, and whispering. The patient is apt to feel and press the larynx or trachea with his fingers. When the larynx is the seat of the local affection, the first words in the morning are uttered with considerable difficulty. The pain in the larynx or trachea is always increased by coughing, external pressure, and by the inhalation of irritating vapors. When the trachea is the part affected, an increase of the pain is experienced on bending the head backwards, or on turning it round. This is not the case when the larynx is the seat of the disease; here the pain, as well as the cough, is increased by the use of stimulating gargles, and the inspiration of cold and damp air. In laryngeal consumption, the cough is generally violent early in the morning, until something is expectorated; and like spasmodic cough, it often subsides for a considerable time, and then returns in sudden and violent paroxysms, the inspiration during the fit of coughing being stridulous, as in croup. A fit of coughing is almost always excited when the patient begins to swallow; and it seems at first as if the cough were excited only by quick and careless swallowing; yet as the disease advances, the utmost caution in this respect will not prevent this act from exciting the cough. (Armstrong.) The quantity of the sputa is not great in the laryngeal variety of the disease; but, in tracheal phthisis it is often abundant, consisting chiefly of a viscid, transparent, and frothy mucus, with small masses of purulent matter floating in it. When the disease is once fully established, the usual symptoms of hectic fever occur, the body wastes rapidly, the skin becomes sallow, and the face generally pale, with a transient flush on one or both cheeks in the evening, and a peculiar haggard and anxious expression of the countenance, with an irritable and dejected state of the mind.

The ordinary *causes* of this variety of phthisis are: neglected catarrh; hooping-cough; measles, and syphilis. Dr. Armstrong mentions an instance which was excited by an external tumor pressing on the windpipe.

2. *Pleural Consumption.*—Another variety of consumption, as is stated above, depends on effusion into the cavity of the thorax from *chronic inflammation of the pleura.* While the effusion into the cavity of the chest is going on, the lung becomes more and more separated from the surface of the thorax, being gradually compressed by the accumulating fluid, until it is reduced to a very small size, and more or less disorganized in its structure. Whilst this is going on, ulceration sometimes takes place in some part of the pulmonary pleura, and the corresponding substance of the lung, and an opening is thus made into the bronchial tubes, through which the effused sero-purulent fluid is discharged by coughing or expectoration. When this takes place, irritative fever, with night-sweats, frequent cough, emaciation, and in short, all the ordinary symptoms of phthisis pulmonalis, usually supervene. This form of pneumonic disease is generally the consequence of acute pleuritis. This affection is characterized by a sense of oppression in the chest on lying down; difficult and hurried respiration on ascending stairs, or muscular exertion; short, disturbed sleep; paucity of urine; a short, tickling cough, aggravated on first lying down; spells of hurried and oppressed breathing after speaking; and, generally, more or less soreness of the external surface of the affected side of the chest. The patient is easiest when in a sitting posture; and "if requested to take a deep inspiration while in the erect position, he will generally do it with little apparent difficulty; but lay him down flat, and cause him to fetch his breath deeply, he will be almost certain to

complain of pain, tightness, soreness, load, or some kind of inconvenience in the chest." (Armstrong.) Death often occurs suddenly, and is almost invariably preceded by considerable œdema of the legs and feet. In some instances, after the effused fluid is discharged through the lungs, the progress of the disease becomes arrested, and the patient recovers a tolerable state of health. When this occurs, the affected side of the thorax contracts to a very manifest degree, forming what Laennec describes under the name of *contracted chest*. In some instances, where ulceration establishes a communication between the bronchial cells and the cavity of the pleura, more or less of pneumothorax occurs; but more generally adhesions take place around the fistulous opening, which prevents the escape of air into the chest from becoming so considerable as to compress the lungs. (Laennec.)

3. *Imposthumous Consumption.*—Consumption from the formation of *an abscess* in the lungs, is an extremely rare occurrence, although formerly supposed to be one of the most common forms of the disease. Laennec states, as the result of his observations, that small abscesses in the pulmonary tissue are not found above four or five times, and large ones not above once in several hundred cases. He regards almost the whole of the reported cases of pulmonary abscesses of the lungs as excavations formed by the softening of tubercular masses. It is nevertheless probable, from the observations of others, that abscess of the lungs is not so uncommon as is asserted by Laennec. Armstrong mentions several instances of this kind, and cases are related by Morgagni, Baillie, Foubert, Wright, Heller, Lettsom, and many others.

4. *Ulceration with melanosis* of the substance of the lungs, is also occasionally met with in phthisis pulmonalis. I have seen one remarkable instance of this variety of phthisis, in consultation with Dr. Monges and Dr. M'Clellan. Bayle says that this form of the disease occurs only in adults, and most commonly in persons of advanced age. "The lungs of those who die of this affection, present more or less extensive ulcerations, the parietes of which are as black as charcoal, very firm, and several lines in thickness. The parts not in the immediate vicinity of these melanosed ulcers, appear to be perfectly healthy; but if the disease affects the whole lung, it is hard, compact, black, resembling sometimes leather half burned."

Phthisis from melanosis is often of long duration, and seldom gives rise to any alarming symptoms until it has continued for a considerable time. The patient usually has a moderate cough, attended with a whitish or puruloid matter, slightly opaque, and usually in roundish masses, swimming in a considerable quantity of a thin mucus. These sputa always swim in water. There is little or no pain whatever felt in the chest; and in some cases the patient is entirely free from feelings of indisposition. Nevertheless, the body gradually wastes; the pulse is generally somewhat more frequent than natural, and occasionally, the cough excites vomiting. At last the emaciation usually becomes extremely great, although the patient seldom complains of much illness or uneasy sensations. Very considerable œdema of the legs is a common occurrence towards the conclusion of the malady.

5. *Cancerous Consumption.*—The substance of the lungs is liable to a species of cancerous degeneration, giving rise to a slow and most fatal variety of phthisis pulmonalis. Fortunately, however, this is a very rare variety of pulmonary disease. When the cancerous masses are insulated, there are, in general, many of them throughout the lungs; but the surrounding pulmonary structure is usually in nearly a healthy state. "When, however, the cancerous masses are not insulated, different portions of the lungs, and, occasionally, some of the bronchial glands, are transformed into a white substance, evidently of a cancerous character, belonging, in fact, to that variety of cancer designated by M. Laennec under the name of *dégénérescence cérébriform*. The diseased parts are white, somewhat shining, sometimes of a firm consistence, and at others already softened, and always traversed by extremely small blood-vessels. When the softened

parts are compressed, a liquid matter issues from a great number of points, bearing a strong resemblance to cream. This degeneration pursues the same course that other cancerous affections do, and resembles much in its intimate structure the cancerous masses which are sometimes developed in the liver, as well as the alterations which occur in the mucous membrane of the stomach, when this organ is affected with scirrhus." (Bayle.)

The progress of cancerous consumption is very slow. At first, the respiration is somewhat obstructed, attended with a dry cough, which is rarely very troublesome. As the disease advances, the patient begins to feel some pectoral oppression, the cough becomes more troublesome, and the patient experiences, at times, transient pains in the chest. These pains gradually become more frequent and prolonged until they are constant, at the same time that the cough becomes less dry, and a more or less abundant expectoration of white matter ensues. The skin is usually of a pale yellow color. This affection, says Bayle, seldom if ever occurs in persons under thirty years of age, and the majority of those who labor under it are at the same time affected with cancerous tumors in other parts of the body.*

6. *Granular Consumption.*—In some cases of phthisis, the lungs contain an immense number of *transparent*, shining, miliary granulations. These granulations vary in size from that of a millet seed to that of a grain of wheat, and appear to be of cartilaginous consistence. Mr. Bayle thinks that they differ entirely from miliary *tubercles*, which latter, he says, are always gray or white, and *opaque*, and terminate by complete softening. The miliary granulations, generally, at last, give rise to ulceration of the pulmonary parenchyma, and when this takes place, the ulcerated cavity is always found lined with an albuminoid membraniform substance.†

7. *Tubercular or Scrofulous Phthisis.*‡—This is a most fatal and unmanageable form of pulmonary consumption. In the commencement of the disease, slight aching pains, with a sense of tension or tightness, is experienced in some part of the chest, together with a short and dry cough, which is readily excited by muscular exertions. Respiration is shorter and more frequent, and deep inspiration is usually attended with a feeling of uneasiness and tightness in a particular part of the breast. These symptoms gradually become more conspicuous; and at length slight febrile irritation occurs towards evening, and the pulse and respiration continue to be somewhat accelerated throughout the whole day. A fit of coughing usually occurs in the morning, and the patient rises out of bed in a relaxed, languid, and feeble condition. An extreme liability to catarrh, on the slightest exposure to cold and damp air, exists. The bowels are usually somewhat torpid; the tongue is moist, often clean, and of a pale pink-color, or covered with a thin white fur. By degrees the cough becomes more frequent and troublesome—particularly in the evening and morning, or at night on awaking from sleep. Great sensibility to low temperature is manifested by the patient. As the disease advances, the albuginea acquires a peculiar pearly whiteness; the skin, lips, tongue, and fauces, become dry in the afternoon, slight chills regularly occur about mid-day, followed by distinct febrile exacerbations, during which one or both cheeks are suffused with a circumscribed flush; a dry and burning heat is felt in the palms of the hands and the soles of the feet; the breathing is very quick and short, and the pulse very frequent, small, quick, and tense. These febrile paroxysms continue until towards midnight, when they

* Recherches sur la Phthisie Pulmonaire. Par G. L. Bayle, p. 36.

† Loco citat., p. 37.

‡ [In the first volume of his recent and admirable publications, Dr. Chapman maintains the position that tubercles and scrofula are essentially different in their characters. He decides that the deposits of true phthisis partake of the malignancy of cancerous and other morbid and intractable growths. Dr. Elliotson appears to countenance the same idea, and dissents from the opinion of Laennec, that tubercular cavities are occasionally cicatrized. Andral has also formed the same opinion in regard to the imaginary cicatrices on the surface of the lungs.—Mc.]

terminate in more or less profuse perspiration, which continues till morning, leaving the patient exhausted, languid, and depressed. Previous to the occurrence of these latter irritative phenomena, the expectoration, which at first was scanty and frothy, becomes thicker and purulent, and *occasionally streaked with blood*. By degrees the sputa assume more and more the character of genuine pus; the evening exacerbations become more distinct, the night-sweats more profuse; the burning in the palms of the hands and soles of the feet more distressing; the cough more frequent and violent; and emaciation makes evident progress, attended with increasing failure of strength—in short *hectic* fever is now completely developed—the pulse being seldom less than 130 during the evening exacerbations, although generally languid, weak, soft, and not much above its natural frequency in the morning. Towards the unfavorable termination of the disease, œdema of the feet, and colliquative diarrhœa, almost invariably come on, accompanied with a weak and hoarse voice, often aphthæ in the fauces, difficulty of swallowing, and sometimes ulcerated throat. The mind generally continues to be unaffected to the last; but in some instances, "a degree of languid delirium occurs for some days, and occasionally total imbecility for a week previous to death."

It is a remarkable circumstance, that pulmonary consumption is very generally suspended in its progress by pregnancy. I have met with five or six instances of this kind. As soon as the delivery of the child has taken place, the consumptive symptoms resume their force, and generally advance with rapidity to a fatal termination.

It is equally remarkable that the symptoms of pulmonary consumption occasionally, though indeed very rarely, alternate with mania. I am at this time attending a young lady in the last stage of phthisis, who has for four months past been in a state of continued mental derangement. She complains of no pectoral uneasiness, and does not appear to be conscious of laboring under this disease; although her body is now extremely emaciated, and she coughs almost continually, and has a copious purulent expectoration.

Dr. Storer* has published some interesting observations on the conversion of phthisis pulmonalis into inflammation of the brain. The cerebral affection usually commences with headache, which gradually increases, whilst the consumptive symptoms disappear *pari passu*, until delirium and finally fatal coma ensue. From one of the cases which he has published, it would appear, that by subduing the disease of the brain, we may frequently put a permanent stop to the pulmonary affection. Dr. Abercrombie, also, has related several highly interesting cases of mania, and other forms of acute cerebral affection supervening on phthisis pulmonalis, with the speedy cessation of the symptoms of this affection.† Similar instances are mentioned by Dr. Parry.‡

Tubercular consumption probably never occurs, except in individuals of a strumous diathesis;§ and it is doubtful, as Dr. Armstrong observes, whether tubercular matter be ever formed in the lungs without a constitutional or hereditary predisposition to them. Be this as it may, it appears to be well ascertained, that

* Transactions of the Medico Chirurg. Society of Edinburgh, vol. iii. part 2, p. 613.

† See his work on the Brain, &c., cases 29, 45, 55, 56, and 57.

‡ Elements of Pathology and Therapeutics, pp. 385 and 388.

§ Tubercles are, I believe, never found in the lungs of still-born children, or of such as die soon after birth. Dr. Denis, Elève Interne, at the Hospital of *Enfans Trouvés* at Paris, declares, "On n'a pas encore trouvé jusqu'ici de tubercules pulmonaires avant le premiers mois que suivent la naissance. On commence seulement à les rencontrer dans des enfans de 5 ou 6 mois."(*a*) Velpeau also states that he has never found any tubercular depositions in new-born infants, though he has long directed his attention to this subject: and Breschet, who is surgeon to the Hospital Enfans Trouvés, at Paris, makes the same declaration. Orfila, however, states that he has in a very few instances met with tubercles in still-born infants.

(*a*) Recherches d'Anatomie et de Physiologie Pathologiques sur plusieurs maladies des Enfans nouveaunés.—Par M. Denis, M. D.

wherever this predisposition does exist, any cause which is capable of irritating the lungs may give rise to the deposition of tubercular matter into their substance, and lead, consequently, to the development of phthisis pulmonalis. It has, however, been a subject of considerable controversy, whether inflammation is capable of causing the deposition of tubercular matter into the lungs. Bayle, Laennec, Rostan, Louis, and Velpeau, are disposed to allow but little or no influence to inflammation in this respect; whilst Alison, Andral, Cruveilhier and Broussais maintain that inflammation is frequentiy intimately concerned in the production of tubercular matter. The following observations of Andral, on this subject, are probably correct: "If the disposition to the formation of tubercles is very strong, then the slightest local congestion of blood is sufficient to give occasion to it; if this disposition is less strong, it is requisite, for the formation of tubercular matter, that the congestion of blood should be so considerable, and so permanent, as to amount to inflammation. But, when there exists no such predisposition, the most intense and the longest continued inflammation will not produce a tubercle."* Tubercular matter would seem to be formed by a kind of exudation or secretion into the pulmonary tissue; and as it appears to be unorganized, may be regarded as an extraneous substance, obstructing the pulmonary circulation, and giving rise to more or less local irritation. Tubercular depositions in the lungs do not, however, inevitably lead to consumption; for it would seem to be well ascertained, that tubercles may exist in the pulmonary structure *in a dormant* state—that is, without entering into the process of softening, or exciting inflammation—and without giving rise either to local inconvenience, or general disturbance of health. (Armstrong, Laennec.) In individuals of a scrofulous habit, the formation of tubercles is sometimes very rapid, when pulmonary irritation is excited by an accidental irritating cause. In the beginning, tubercles have the appearance of semitransparent grains; and as they gradually increase in size, they become united into regular masses, and assume a yellowish and opaque appearance. M. Laennec asserts, that the conversion of the tubercular matter into a soft pus-like fluid, is not effected in a manner similar to what takes place in suppurative inflammation; but by a peculiar process of softening, wholly distinct from suppuration. The softening commences in the centre of the tubercle, and gradually proceeds outwards, until the whole mass is converted into a whitish, cream-like matter, which, making its way into the bronchial tubes, is discharged by expectoration, leaving a kind of fistulous cavity. These tubercular excavations become lined with "a species of morbid membrane, of a white and opaque appearance, and very soft consistence; external to which, another membrane of a semi-cartilaginous structure is formed. Bayle thinks that the *pus*, expectorated in scrofulous consumption, is secreted chiefly by the lining membrane of the tubercular cavities; but Laennec asserts, that the greater part of the purulent matter expectorated proceeds from the mucous membrane of the bronchia, which always suffers irritation and chronic inflammation, to a greater or less extent, in every variety of pulmonary consumption. Purulent expectoration from this source occurs in some instances of tubercular lungs, even before the tubercles have undergone the process of softening. Every case of tubercular phthisis consists, therefore, of at least two, and sometimes three, simultaneous processes: viz: 1, "the proper tubercular action either in a state of growth or increase, or in that of softening or destruction; 2, of a degree of chronic inflammation of the mucous membrane of the bronchia; and 3, sometimes of inflammation of the pulmonic tissue, of a chronic character, and tending to hepatization."

Causes.—As has been already stated, persons may be decidedly predisposed to phthisis, and even affected with a tubercular state of the lungs, and yet escape the disease, if no adequate exciting cause supervene to rouse it into action. In some instances, functional or organic diseases of the liver develop the disease where the predisposition to it exists. Catarrhal affections, however, are by far

* Clinique Médicale, t. iii. p. 13.

the most common exciting causes of the disease. The tubercles may also be excited into action by a fixed irritation located in any of the principal viscera, more especially in the alimentary canal. Repelled cutaneous eruptions have a strong tendency to develop the tubercular action, as indeed all other morbid impressions on the skin have in subjects of a phthisical habit. The sympathy between the external surface and the lungs is intimate and strong, and an irritation seated in the former seldom fails to manifest itself in the latter organ—more especially when the lungs are in a state of habitual debility or predisposition to morbid action. It is on this account that phthisis pulmonalis is so common a disease in cold and variable climates, where the cutaneous function is so liable to sudden and frequent interruptions or variations of activity. Among the ordinary exciting causes of this affection, we may also mention the healing up of old discharging sores, atmospheric vicissitudes, the abuse of mercury, intemperance in the use of spirituous liquors, sedentary occupations, excessive venereal indulgence and onanism, copious losses of blood, the depressing passions, the admission of irritating vapors or fine particles into the lungs—to which latter cause stone-cutters, glass-grinders, millers, needle-grinders, &c., are particularly exposed.

Prognosis.—The different varieties of pulmonary disease mentioned above vary very considerably in the degree of sanability peculiar to them respectively. That form of consumptive disease which depends upon chronic bronchial inflammation, is by far the most under the control of judicious remedial treatment; and where the mucous tissue remains free from ulceration, or the subjacent pulmonic structure has not become consolidated, recoveries are by no means uncommon.

Laryngeal and *tracheal* consumptions are extremely dangerous affections. I have never known an instance of recovery from this variety of the disease. Cases of recovery have, however, been related by authors, but the number of such instances is very limited.

Consumption from chronic pleuritis is much more difficult of cure than that which depends on chronic inflammation of the mucous membrane of the lungs; yet in some instances the disease subsides, and the patient regains a consideable degree of health. When a cure is effected, the effused fluid is either gradually absorbed while the lungs expand, or it is discharged through the lungs by an opening into the bronchial tubes from the cavity of the pleura, or it escapes externally by an opening into the cavity of the chest through the intercostal spaces.

Tubercular consumption may be regarded as an incurable disease; for tubercular matter, so far as we know, is wholly incapable of being absorbed or otherwise removed. "Previously to the knowledge of the true character and mode of development of tubercles," says Laennec, "and while consumption was considered as a consequence of chronic inflammation, and slow suppuration of the pulmonary tissue, medical men did not question the possibility of curing the disease by a suitable mode of treatment, especially if taken in time, and during the first stage. It is now, however, the general opinion of all those who are acquainted with the actual state of our knowledge respecting the pathology of diseases, that the tubercular affection, like cancer, is absolutely incurable, inasmuch as nature's efforts towards effecting a cure are injurious, and those of art useless." However impossible it may be to remove tubercular matter when once formed, or to cure consumption depending on it, there can exist no doubt that we may occasionally so retard, or even arrest its progress by proper management, as to prolong life to a very considerable extent. Nay, it is equally certain, that by carefully avoiding those causes which tend to favor the conversion of tubercular matter into a pus-like fluid, persons who are manifestly strumous, or affected with incipient tubercles in the lungs, may pass through a long life without the actual development of consumptive symptoms. Although tubercular consumption may be regarded as incurable by art, yet in some rare

cases a spontaneous cure has taken place after the softening of the tubercular matter and the formation of an ulcerous excavation. Laennec, upon whose authority this statement is made, mentions two cases which terminated favorably in this way. Such cures, he says, are effected in two ways: 1, by the cavity becoming invested by a new membrane of a semi-cartilaginous structure, which, when completely formed, constitutes a kind of internal cicatrix, analogous to a fistula, and "is, in many cases, not more injurious to health than this species of morbid affection;" 2, the cure may also be effected by a spontaneous obliteration of the cavity by a cicatrix consisting of cellular, fibrous, or cartilaginous structure. Such cures are, however, extremely rare, and depend in no manner on medical treatment. (Laennec.)

Treatment.—Of the treatment appropriate to *catarrhal consumption* I have already spoken fully, under the head of *chronic bronchitis*, and the subsequent therapeutic observations refer chiefly to tubercular phthisis. Notwithstanding the uncontrollable and fatal character of tubercular consumption when once fully developed, patients laboring under this form of disease are not to be abandoned to their fate, without making an effort to arrest, or at least to retard its progress; for although the hope of *curing* the malady, after its complete establishment, is wholly fallacious, experience has fully demonstrated the fact, that by judicious management we may often keep the tubercles in a dormant state, interrupt their progress, or, at least, greatly retard their passage into an active condition. In consumptive habits, everything which tends to irritate the system, more especially the respiratory organs, should be carefully avoided. Attention ought, above all, to be directed to the regular maintenance of the perspiratory function; and with this view, the patient should be directed to wear flannel next his skin, to protect himself by proper clothing against the influence of low temperature, and to avoid, as much as his circumstances may admit, the effects of atmospheric vicissitudes. In the incipient stage of every variety of pulmonary consumption, our constant object should be to counteract the inflammatory diathesis of the system, and to remove all sources of irritation. The regimen must be strictly antiphlogistic. In general, vegetable and farinaceous diet, with milk, is the only proper nourishment for a patient laboring under incipient phthisis. The system, in all phthisical habits, is peculiarly excitable, and readily thrown into a state of general and injurious irritation by even weak exciting causes. It would be in vain to expect a reduction of the local pulmonary irritation, so long as the system generally is in a state of preternatural excitation. In conjunction with a mild unirritating diet, the wearing of flannel next the skin, and the careful avoidance of inclement and variable weather, gentle exercise, either by walking, riding on horseback, or in an open carriage, when the air is mild and uniform, will tend to invigorate the system, and lessen its morbid irritability.

Bleeding is highly recommended by some in the early period of phthisis pulmonalis; and when cautiously employed in cases attended with an evident inflammatory condition of the general system, its effects are often beneficial. To draw blood copiously, or very frequently, however, would, in most instances, prove injurious by increasing the debility and morbid excitability of the system. The abstraction of blood by cupping or leeching, in cases which indicate the propriety of direct depletion, will in general answer all the purposes which can be expected from this measure. To expect to effect the permanent reduction of the quickness, tension, and frequency of the pulse by venesection, is a fallacious hope. The system in this disease is preternaturally excitable or irritable; and in order to reduce the velocity and momentum of the circulation, measures must be employed which tend to subdue this morbid irritability, an effect which cannot be obtained from venesection. To accomplish this purpose, we possess no remedies which are so safe and so effectual as digitalis, and small doses of tartar emetic. The former of these articles has a powerful tendency to diminish the excitability of the heart and arteries, and consequently the velocity of the circulation. Much diversity of opinion has been expressed in relation to the

value of this medicine in consumptive affections. My own observations have led me to the conviction, that under careful management, and in conjunction with a well-regulated diet, and proper attention to the cutaneous functions, much good may be derived from its employment in incipient phthisis. Its salutary operation would seem to depend on its power of lessening the activity of the heart and arteries, and thereby moderating the momentum of the circulation, and consequently the general and local irritated condition of the disease.

Among the most important remedies we possess in the early periods of phthisis, are such as operate through the medium of the skin, or such as establish a regular determination to the external surface of the body. *Blisters*, *issues*, or *setons*, can never be properly omitted in incipient consumption. I have repeatedly known the insertion of a caustic issue or a seton on the chest, to remove every symptom of approaching consumption. Even in cases completely developed, counter-irritation, in any of these modes, will generally aid very materially in retarding the progress of the malady. I am disposed to ascribe more remedial power in this affection to setons and issues than to blistering, and of these two, I generally prefer the latter.

Pustulation with tartar emetic, or with the white precipitate ointment, is also a very efficient mode of counter-irritation in this disease. I have seen much benefit derived from both these applications in its incipient stage. When the pustules are formed, emollient poultices should be applied to them, and renewed two or three times daily, until they are healed. Whatever counter-irritating measure be adopted, it should be regularly persevered in, until all the threatening symptoms have entirely disappeared, or its manifest efficiency be ascertained.

To aid the effects of flannel next the skin, and of a warm and equable temperature in maintaining a regular action of the cutaneous exhalents, advantage may be derived from the use of small portions of *tartar emetic* dissolved in some mild diluent beverage, in the commencement of the disease. A grain or a grain and a half of this antimonial may be dissolved in a pint of gum Arabic water, and drank during the day. M. Lenthois, of Montpellier, speaks strongly in favor of this remedy in phthisis. His mode of employing it is as follows:— A grain of tartar emetic is to be dissolved in eight tablespoonfuls of water; this is to be mixed with four quarts of water, or a tablespoonful to the pint, which the patient is directed to use for his common drink at meals, and at all seasons and hours. Dr. Armstrong directs the use of this article in doses sufficiently large to excite nausea and occasional vomiting. "I suspect," he says, "that if a regulated temperature and the exhibition of tartarized antimony were more early and perseveringly employed than they usually are, our success in preventing the development of phthisis might be much greater than it commonly is." The account which Lenthois gives of the usefulness of tart. antim. in the present affection is certainly exaggerated; but although not, perhaps, of itself sufficient to arrest the progress of incipient phthisis, it deserves, nevertheless, very considerable attention as an auxiliary means. The employment of *emetics* in this disease was formerly much recommended by some writers. Dr. Maryatt gave the sulphate of copper and tartar emetic in doses of from two to five grains of the former with two grains of the latter twice a week, without allowing the patient any kind of drink for several hours afterwards. Dr. Senter advises to give the blue vitriol in conjunction with ipecacuanha (seven grains of each), in the morning before receiving anything into the stomach, and withholding all kinds of drink for some time afterwards. Unquestionably, however, the most efficient of all measures for counteracting the tendency to phthisis, or arresting its development or progress, is a removal to, and residence in, a mild, genial, uniform, and salubrious climate. The influence of such an atmosphere, aided by proper diet, regular and gentle exercise, and external revulsives, with an attention to the hepatic and intestinal functions, will do all, perhaps, that remedial treatment is capable of effecting towards permanently arresting the progress of the disease

in its incipient stage. The climates of Naples, of Nice, of Florence and of Rome, and lately of Egypt, as well as of some of the southern parts of France and Spain, have been particularly recommended to consumptive invalids. Nothing, however, is to be expected from the influence of a warm climate after the disease is once fully developed. It is only in the *incipient* stage of the complaint that any permanent advantages can be obtained from this source, in *scrofulous* phthisis.*

Upon the foregoing remedial measures—namely, occasional small bleedings, external irritating applications, antimonials, a regulated temperature, a simple unirritating diet, and exercise by walking or gestation, our hopes must be mainly placed in our efforts to arrest the disease in its incipient stage. A variety of other remedies have, however, been recommended in this affection; and of these *prussic acid* has of late years attracted the greatest attention. Could the dose be regulated with any degree of certainty, so as to procure its influence without the risk of dangerous prostration, advantage might, no doubt, be derived from its employment. Possessing, as it does, a direct and most powerful tendency to subdue the irritability and sensibility of the system, it would seem to be peculiarly calculated to do good in the present affection, in which a particularly excitable condition is so conspicuous.

When the disease is once completely established, and purulent expectoration with *hectic* fever has supervened, we can no longer hope to procure a favorable issue by remedial management; and all our efforts must be directed to the palliation of the symptoms and the prolongation of its course. With the exception of depletion, the remedies already mentioned as most apt to arrest incipient consumption or prevent its development, are also among the most useful means in retarding its progress when fully established. When the system is much exhausted in the confirmed stage of the disease, *tonics* are commonly resorted to, but although I have tried them often in scrofulous phthisis, I do not remember having ever derived any obvious advantage from them—but most commonly they increased the general irritation.† Where it becomes necessary to support the strength of the system, we may allow a more nourishing diet, particularly the more digestible and nourishing kinds of meat—such as tender beef-steak or mutton.

To check the profuse and exhausting night-sweats which occur in the advanced periods of the disease, I know of no remedy which is so effectual as the *acetate of lead*. I have frequently prescribed this article with unequivocal benefit in this respect. Four or five grains of the acetate may be taken in the evening. I have known some patients who, after having experienced the relief which it frequently procures, would not do without it. The best mode of giving it is in union with opium. Some of the mineral acids are also recommended for this purpose. Of these, the diluted sulphuric acid, or *elixir of vitriol* is the best. Opium is a highly valuable palliative in the advanced stage of phthisis. It generally allays, for a time, the violence and frequency of the cough; tends to diminish the night-sweats, as well as the general feelings of distress, illness, and discomfort; and, at last, assuages the pangs of approaching dissolution by its soothing and oblivious effects on the nervous system. When opium produces disagreeable effects from idiosyncrasy, the *lactucarium* may be used in two or three grain doses with excellent effect. We may also employ Dover's powder in union with the extract of hyoscyamus as an anodyne palliative, where opium by itself is objectionable. Six grains of the former, with three grains of the latter, may be given every night.

* See Dr. Carter's "Remarks upon the Effects of a Warm Climate in Pulmonary Consumption, and some other diseases"—*Medico-Chirurg. Transact.*, vol. vi.—See also Medical History of the British Army in Spain—*Medico-Chirurg. Transact.*, vol. vi.

† The tonics most commonly employed in phthisis pulmonalis are the *mistura ferri compos.*, the quinine, and particularly Dr. Griffith's mixture,—thus: ℞ Myrrh. ℥i, terendo mortario cum spirit. piment. ℥vi, aq. destil. ℥viss, dein adde subcarbon. potassæ ℥ss., sulphat. ferri. grs. xii. syrup. ℥ii.—M. Take ℥ii. four times daily.

Dr. Bourne, professor of the practice of physic in the University of Oxford, speaks strongly in favor of the employment of *uva ursi* in consumption. He asserts that he cured nine cases out of sixteen by the use of ten grains of uva ursi with one-third of a grain of opium three times daily. In consumptive symptoms from chronic bronchitis, I have derived much benefit from these two articles given in combination; and the cases related by Mr. Bourne were probably of this kind.*

Expectorants are sometimes useful to palliate the cough. Flaxseed tea, decoction of the *lichen Icelandicus*, solution of gum Arabic, infusion of tussilago or of marshmallows, the camphorated tincture of opium, and syrup of squills in equal proportions, or syrup of poppies with tincture of *tolutan*, may be used for this purpose. Small doses of opium and tartar emetic, as recommended by Pariset, will generally answer very well.†

The inhalation of *tar-fumes* is not adapted to the treatment of tubercular consumption. In the catarrhal variety of the disease, much benefit may be occasionally derived from this and similar inhalations. Nor is mercury a remedy calculated to do good in the present form of phthisis, although much recommended by some practitioners. The cases of consumption which are reported as having yielded to ptyalism were, no doubt, dependent on chronic mucous inflammation, unconnected with a strumous habit of tubercles in the lungs. Too little discrimination was formerly made between the different varieties of pulmonary disease attended with consumptive symptoms; and it is to this circumstance that we may ascribe the discordant and contradictory statements that have been published in relation to the effects of different remedies and modes of treatment.

Laryngeal and tracheal phthisis appear frequently to commence with an obscure inflammation in some parts of the larynx or trachea, which may continue for months before ulceration occurs. This incipient stage is characterized by more or less hoarseness, change of voice, and disturbed respiration; and it is only during this early period of the disease, before ulceration has taken place, that any decided and permanent benefit can be derived from remedial treatment. Whenever, therefore, we find hoarseness of voice, with cough, disturbed respiration, and a slight prickling pain in the larynx or trachea to continue for some time, particularly when there is no reason to ascribe these symptoms to common cold, we ought immediately to adopt the most active measures for the removal of the affection. Should ulceration not have taken place, we may, perhaps, succeed in preventing it, and in saving the life of the patient. (Armstrong.) One of the most indispensable curative means is a mild and uniform temperature. On no account should the patient be suffered to expose himself to a cold or humid atmosphere. While these precautions are observed, blisters should be applied to the throat, and the blistered surface kept discharging by irritating dressings. Armstrong recommends the use of *balsam copaiba* in the early stage of this variety of the disease. In several cases which have lately come under my care, the use of the muriate of ammonia, according to the formula mentioned at page 100 of this work, appeared to do much good. When the disease arises from syphilis, mercury may be regarded as the principal remedy in conjunction with a regulated temperature and blistering.

In consumptive symptoms from chronic pleuritis, our principal reliance must be placed on external irritating applications to the chest, the use of calomel so as to produce gentle ptyalism, and diuretic medicines. Blisters or tartar emetic ointment should be repeatedly applied so as to keep up a constant irritation on the external surface of the chest. Internally, we may give calomel and squills

* Cases of Consumption, &c., healed by uva ursi, &c. By Dr. Bourne, London, 1806.

† ℞.—G. opii grs. x.
Tart. antim. grs. iv.
Conserv. rosar. q. s.—M. Divide into forty pills. S. Take one every four hours.

in combination, with a view both to a general mercurial impression and the production of diuresis.

CHAPTER XIII.

OF THE PHLEGMASIÆ OF THE URINARY AND GENITAL ORGANS.

SECT. I.—*Nephritis.—Inflammation of the Kidneys.*

THE symptoms which characterize acute inflammation of the kidneys are not, in general, obscure or equivocal—being usually readily distinguished from those of other painful affections seated in the neighborhood of these organs. When this affection is excited by cold, it commences commonly like other diseases from this cause, by slight chills and flushes of heat—the febrile reaction preceding the occurrence of pain in the loins. When the disease proceeds from contusions, strains, and irritation of renal calculi, cantharides, or other irritating substances absorbed into the circulation, or from metastasis of gout and rheumatism, the first intimation of its occurrence is an acute pressing pain in the right or left lumbar region, or in both. The pain* is deep-seated, and of a very severe aching character, and but very little aggravated by external pressure. Any sudden concussive motion of the body, however, always increases the pain considerably. The pain often darts down along the ureters—the testicle of the affected side is retracted towards the abdominal ring, and a sense of numbness is experienced in the thigh. Nausea and vomiting occur in most cases, and violent colic pains in some. The bowels are torpid; the urine is very small in quantity, high-colored, sometimes tinged with blood; and the desire to void it is frequent, urgent, and troublesome. When both kidneys are inflamed, the secretion of urine is generally almost entirely suppressed;—this, indeed, happens sometimes when the inflammation is seated but in one kidney, the other having its functions disturbed sympathetically.† The patient is easiest when he inclines his body towards the affected side, so as to take off the tension of the lumbar muscles. When in bed, he lies either on the affected side or on the back, with the body inclined towards this side. In some instances, a dull heavy pain is at first felt low down, seemingly where the ureters enter the bladder, and afterwards passes slowly up along the ureter until it reaches the kidney, where it becomes stationary. The pulse in nephritis is full, hard, and frequent in the early period of the affection; but after the second or third day, it generally becomes smaller and more frequent, particularly where much nausea and vomiting occur. The surface is above the natural standard of temperature, and usually very dry and parched.

Diagnosis.—From inflammation of the psoas muscle, nephritis may be distinguished by the pain in the former affection being always considerably increased

* M. Bouillaud asserts, contrary to the general statement of pathologists, that pain does not always attend renal inflammation.

† This is always a very unfavorable occurrence. Total or almost entire suppression of the urinary secretion can never continue long in any affection without adding greatly to the danger of the disease. Complete *ischuria renalis*, even without the irritation of local inflammation, seldom continues beyond four or five days without producing fatal oppression of the brain.—(Sir H. Halford, *Transactions of the College of Physicians of London*, vol. vi.) There is a case mentioned, however, by Dr. Laing, in vol. x. of the *Edin. Med. and Surg. Journal* where the secretion of urine was suspended for nine days without terminating fatally. The great danger from suppression of this secretion in nephritis was long ago noticed by Aretæus.—*De Causis et signis Morborum, acut.*, lib. ii. cap. ix. p. 22.

on bending the body forwards, whereas, in the latter disease, this position generally lessens the pain. Nephritis is usually attended with more or less nausea and vomiting, and frequent desire to pass off urine, which is not the case in psoas inflammation, unless the kidneys become affected at the same time. From lumbago, nephritis is distinguished by the paucity of the urine, the dysury, the nausea and vomiting, the pain shooting down the ureters in the latter affection; and by the great increase of pain on assuming the erect position, or by any motion of the muscles of the loins in the former, whilst in the latter, little or no increase of pain occurs from these causes.

Nephritis is generally rapid in its course. It seldom continues beyond the seventh day without terminating in resolution or tending to suppuration. When the disease is about terminating favorably by resolution, the fever and pain decline; the skin becomes uniformly moist; the urine is copious, turbid, or charged with mucus; and the nausea and vomiting cease.* The symptoms which denote occurrence of suppuration are—frequent chills or shiverings; a dull, heavy throbbing, instead of the preceding acute pain in the kidney; a slight abatement of the febrile symptoms; and a feeling of heaviness or numbness in the affected part.

In some instances, the abscess bursts into the pelvis of the kidneys, and is then discharged with the urine. This is not so favorable an occurrence as might at first sight appear. I have known purulent matter discharged with the urine for upwards of nine months, from a renal abscess. In some instances, more or less pus is discharged with the urine for several years—producing at last hectic and great emaciation, or what has been called *tabes renalis*. A puruloid substance in the urine must not, however, be too hastily pronounced as the result of renal suppuration, or as genuine pus. The irritation of a calculous concretion in the kidneys will sometimes gives rise to a secretion resembling pus; and the same discharge may occur from subacute inflammation of the neck of the bladder. Genuine pus in the urine may generally be distinguished from a puruloid fluid mixed with this secretion, by the former sinking down and forming a thin uniform layer along the bottom of the vessel in which the urine is left standing; whereas, the latter substance remains partly suspended in the urine, and does not settle down into a close layer along the bottom of the vessel.†

In some cases the abscess points externally, and may be evacuated by an incision into the soft fluctuating tumor. Cases are on record which terminated favorably after the matter had obtained exit in this way; but in many instances of this kind, a fistulous opening remains, which it is always extremely difficult and sometimes impossible to heal—the patient gradually sinking under symptoms of hectic.‡ Authors mention instances of renal abscesses having opened into the intestines; and Richter states that the matter has found its way into the liver, and even into the cavity of the thorax.§ Renal abscess has also been known to burst into the cavity of the abdomen, giving rise to rapid and fatal peritonitis,‖ and instances have occurred in which the matter has passed down along the psoas muscle, and pointed at the upper part of the thigh like psoas abscess.

Inflammation of the kidneys occasionally, though rarely, terminates in gangrene. Scirrhus, or induration of the kidneys, also, sometimes results from this affection. Bonetus relates several examples of this kind.¶ M. Bouillaud men-

* *Aetius* says that a watery and pellucid urine indicates a slow and difficult declension of the disease—"aquosæ autem mictiones, et puræ ac pellucentes ægre morbum secerni indicant."—*Sermo* xi. cap. xvi.

† Van Swieten observes, when the matter comes from the bladder, there is discharged with the urine a sort of foliaceous fragments; but when it proceeds from suppuration in the kidneys it is more uniformly mixed with the urine.—*Comment.*, vol. x. p. 38.

‡ Hic autem morbus molestus est ex eoque plures ad renum tabem deveniunt.—*Hippocrates, De Intern. Affect.*, cap. xvi.

§ Specielle Thérapie, b. i. p. 615. ‖ Vogel. Handb., t. iv. p. 398.—Richter, Sp. Thérap.

¶ Sepulchret. Anat., tom. ii.—as quoted by Morgagni.

tions a change of the parenchymatous substance of the kidneys into a tuberculous or encephaloid matter, as the result of renal inflammation; and in several cases he found the structure of this organ converted into a yellowish sebaceous matter.*

Causes.—From the intimate relation which exists between the kidneys and the skin, *cold* becomes a very frequent cause of this affection. In many instances, it arises from causes acting directly upon the kidneys—such as irritating diuretics, cantharides, turpentine, renal calculi or gravel, contusions, strains, &c.; and in persons subject to gout or rheumatism, the disease sometimes occurs, rapidly and violently, in consequence of metastasis of these affections.

Treatment.—As in all other phlegmasial affections, prompt and efficient bloodletting constitutes the primary remedy in this disease. In addition to general bleeding, *leeching*, or what appears to be better, *cupping* over the lumbar region must not be neglected. Active purgatives also assist materially in reducing the local inflammation. Six or eight grains of calomel, followed in three or four hours by a full dose of castor oil, or three or four pills of the formula given below, will generally answer this purpose well.† The bowels must be kept in a loose state by the daily administration of aperients; or by laxative enemata throughout the whole course of the disease. Much relief will sometimes be obtained from anodyne emollient injections, particularly in the evening, after the free operation of a purgative. Indeed, the assiduous employment of soothing emollient enemata, either with or without laudanum, is always a most useful auxiliary in the treatment of this affection. For this purpose we may use an infusion of flaxseed, or simply warm water mixed with a portion of milk; or a thin decoction of barley. Fomentations to the external lumbar region will likewise be proper, particularly in the early period of the disease, immediately after leeching or cupping has been practised. A large emollient poultice is a more convenient, and probably a better application for this purpose. *Blisters* are very generally regarded as objectionable in this affection, on account of the tendency of cantharides to irritate the urinary organs when absorbed into the circulation. I have nevertheless derived decided benefit from blistering the region of the inflamed kidney, without having ever known any injurious consequences resulting from it. By suffering the vesicatory to remain no longer than is necessary to inflame the skin—which is seldom more than four or five hours, and then applying an emollient poultice, a full blister will be raised; and I have never known strangury to occur where this mode of vesicating was adopted. I have pursued this practice in ten or twelve cases of nephritis, and generally with evident advantage. *Sinapisms* may also be used, after adequate depletion, with a prospect of benefit; but they are not equal, in efficacy, to blisters, in this as in other internal inflammations.

From the close sympathy which exists between the skin and the kidneys, considerable benefit usually arises from the employment of suitable diaphoretics in this affection. Where the stomach is not too irritable, antimonials‡ may be employed; but where much nausea and vomiting attend, it will be better to depend on the use of the warm bath, more especially the steam bath, for the production of diaphoresis. Hot bricks wrapped in flannels previously moistened with vine-

* Observations on the Anatomy and Diseases of the Kidneys, &c. By J. Bouillaud.—*Journal Complémentaire.*

† ℞.—Extract. colocynth. compos. ℈i.
Calomel grs. xii.—M. Divide into six pills.

‡ ℞.—Spir. nit. dulc. ℥i.
Vin. antimonii ℥ii.
Tinct. opii grs. xxx.—M. S. Take a teaspoonful every hour or two.

Or—℞.—Spirit. mindereri ℥iv.
Tart. antimonii gr. i.
Spir. nit. dulc. ℥ii.
Syrup. limonis ℥ii.
Tinct. opii gtt. xxx.—M. S. Take a tablespoonful every two hours.

gar and water, and laid under the bed-coverings near the patient's body, seldom fail to bring on a more or less copious and uniform perspiration. The nitrate of potash cannot be used with propriety in nephritis, on account of its tendency to excite the activity of the kidneys, an effect which could hardly fail to do mischief in the inflamed state of these organs. All stimulating diuretics, indeed, must be carefully avoided—copious draughts of mucilaginous diluents being the only proper means for promoting the urinary secretions. After the inflammatory condition of the system has been in some degree subdued by the antiphlogistic measures already mentioned, small doses of Dover's powder repeated every three or four hours, will tend to keep up a general diaphoresis, as well as to moderate the local pain and general irritable state of the system. Much relief may also be derived, after proper depletion and purging, from the occasional use of anodyne enemata.*

A slight sensation of pain and soreness is apt to remain in the affected kidneys for several days, and sometimes weeks, after the disease has been subdued. Here *uva ursi*, in conjunction with small doses of opium or Dover's powder, is the best remedy. From twenty to thirty grains of the uva ursi, with the fourth of a grain of opium, or three grains of Dover's powder, may be taken four times daily.

This remedy is no less useful in cases where the inflammation has terminated in suppuration. I have known the extract of conium, with an infusion of uva ursi, to be employed in suppuration of the kidney with complete success. Three grains of the extract were taken three times daily, and a wineglassful of the infusion (one ounce of the uva ursi to a pint of water) every four hours. Minute doses of muriate of mercury with this extract,† have also been found beneficial in abscess of the kidneys. The use of *lime water*, to the extent of from four to six ounces daily, has been recommended in suppuration of the kidneys. (Richter.) Decided benefit has also been derived from the balsam of copaiva; but this article must be avoided as long as there is any evidence of inflammatory action present.

Sect. II.—*Cystitis.—Inflammation of the Bladder.*

Symptoms.—Violent burning, lancinating, or throbbing pain in the region of the bladder—extending to the perineum, and in some instances to the testicles and the upper part of the thighs, attended generally with a sense of constriction in the hypogastric region. The pain is greatly increased by pressure made immediately above the pubis, and the perineum feels sore to the touch. There are frequent, but often ineffectual efforts to void urine, more or less strangury or dysury being usually present. The small portion of urine which passes off is deep red, and often tinged with blood. In some cases there is constant *stillicidium* of urine. Nausea and vomiting, with great anxiety in the præcordia, are seldom absent in this affection. The bowels are constipated, and there is often a sensation of tenesmus, from the inflammation extending to the lower part of the rectum. The pulse is full, hard, and frequent; the skin hot and dry; the thirst urgent, and the patient is restless and dejected. If the disease continues unchecked in its course, more or less swelling occurs in the loins, with increased tenderness in the hypogastrium and perineum. Some diversity occurs in the symptoms, according to the particular part of the bladder in which the inflamma-

* ℞.—Pulv. opii grs. ii.
Mucilag g. Arab. ℥ss.
Lactis tepefact. ℥v. Or,—
℞.—Tinct. opii ℥i.
Infusi lini ℥vi.—M. ft. enema. This injection may be repeated two or three times daily.

† ℞.—Muriat. hydrarg. grs. vi.
Extract. conii maculat. ℥iss.—M. Divide into forty-five pills. S. Take one every morning, noon and evening.

tion chiefly exists. When the neck of the bladder is inflamed, great pain is felt in the perineum, and total retention of urine sometimes occurs, or the patient is tormented with dysury or incessant feelings of strangury. In this case, the introduction of a catheter or bougie causes extreme suffering. "When the posterior part of the bladder is affected, the rectum suffers more particularly, and the patient is harassed by a most distressing and constant tenesmus. Sometimes the inflammation occupies that part of the bladder in which the mouths of the ureters are situated, which thus become involved in the affection, and a suppression of urine, more or less complete, and its consequences, take place; in this case, there is commonly more or less pain and tenderness on pressure in the hypogastric region." (Prout.)

Like other inflammations, cystitis terminates either in resolution, suppuration, gangrene, or induration and thickening of the coats of the bladder. Resolution, besides the abatement of the pain and fever, is attended with general and uniform diaphoresis; a turbid and rather copious urine, passed with little or no pain; and ability to bear pressure on the epigastrium, and perineum. On dissection, the inner membrane of the bladder is generally found minutely injected, so as to give a uniform red appearance to the whole surface. In some instances, the inflammation is confined entirely to the internal coat; in others, it extends to the muscular tunic; and sometimes even to the peritoneal covering.*

Suppuration is not a frequent termination of this affection. (Richter.) Abatement of the violence of the fever and pain, accompanied with chills or rigors, and the sudden appearance of a white matter in the urine, indicate the occurrence of suppuration. In some instances, abscesses are formed in the coats of the bladder, particularly near its neck; and in others, the abscess forms in the cellular structure surrounding the neck of the bladder. When suppuration occurs in the mucous membrane, or when the abscess between the tunics of the bladder bursts into its cavity, the matter will be discharged with the urine. Sometimes the abscess points externally, and may open into the rectum or vagina, or sink down and infiltrate into the cellular membrane of the pelvis. The abscess has also been known to burst into the cavity of the peritoneum; and the matter has made its way into the labia pudendi, and the loose structure of the scrotum.

In some cases the coats of the bladder are thickened and indurated, particularly the internal one. Sometimes fungoid elevations of the mucous membrane occur; at others, indurations are found in different parts, resembling small scirrhous tumors, and some of these are occasionally ulcerated. Firm adhesions have been noticed between the bladder and rectum, as well as between the bladder and uterus, in consequence of acute cystitis. It is sometimes very difficult to distinguish some of these results of inflammation of the bladder during life from calculus.

Gangrene is a frequent termination of cystitis. The majority of instances that prove fatal within the first six or seven days, terminate in gangrene. The occurrence of gangrene is announced by the sudden cessation of pain; cold extremities; profuse and clammy perspiration; great prostration of strength; a cadaverous expression of the countenance; slight confusion of the mind; a small, frequent, and weak pulse; and hiccough.

Causes.—Cystitis may be produced by mechanical irritating substances in the bladder; retained urine; external injuries on the hypogastric region; irritation from acrid substances absorbed and conveyed to the bladder—as cantharides, turpentine, &c.; metastasis of gout and rheumatism; irritating injections forced into the bladder; irritation from the introduction of a bougie, or catheter; gonorrhœa; suppression of hæmorrhoidal discharge, and of perspiration; cold applied to the feet or lower portion of the abdomen; injury sustained in parturition, or from the use of obstetrical instruments.

Treatment.—Acute cystitis is a rapid and highly dangerous affection; and

* Wilson on the Urinary Organs, p. 297.

must be promptly met with the most efficient antiphlogistic measures. Efficient blood-letting must be early practiced, until the activity of the pulse is moderated. After general bleeding, *leeching* is of the utmost importance in this affection. The leeches must be applied to the perineum, about the anus, and to the hypogastric region; and, when the pulse admits of it, they should be reapplied. Immediately after leeching, an emollient poultice should be applied over the hypogastrium, pubis, and perineum. The bowels must be kept open by gentle laxatives and mucilaginous enemata. Much relief is commonly obtained from an emollient anodyne enema, immediately after the rectum has been emptied by a laxative. Attention must be early paid to the evacuation of the urine, should the bladder be found distended by it. Great care, however, is required to avoid all unnecessary irritation from the introduction of the catheter. When the neck of the bladder is inflamed, the pain caused by this operation is generally extremely severe, and it is sometimes impossible to reach the bladder, from the great irritability and spasmodic contraction of its neck. This can, in some degree, be obviated by introducing three or four grains of opium into the rectum an hour before the catheter is used, accompanied with an efficient abstraction of blood, both by venesection and leeching. To promote the action of the cutaneous exhalents, we may employ the warm bath; or, what is better, the steam bath, as mentioned under the head of nephritis. Some of the milder diaphoretics, such as spiritus mindereri, diluted with barley water or flaxseed tea; or small and frequent doses of pulvis antimonialis, or of Dover's powders, may be usefully exhibited, with a similar view. The hip-bath is particularly recommended by Richter as a local application in this affection. After the violence of the local and general inflammatory action has been moderated by the foregoing means, much benefit may sometimes be derived from the internal use of opium and calomel.

Ritcher observes, that opium is a primary remedy in cystitis, particularly when given in union with mercury. Prout also recommends the internal use of this combination. A grain of opium, with two grains of calomel, may be given every four hours. In cases of a *subacute* character, the employment of opium and calomel, in conjunction with leeching, emollient anodyne injections, and fomentations or poultices to the hypogastrium and perineum, is particularly beneficial.—Nitre and blisters are apt to increase the local irritation, and cannot, therefore, be resorted to without a considerable risk of doing injury. "If blisters be employed," says Prout, "they should be used with caution and permitted to remain only for a short time, and afterwards such dressings applied as tend to keep them open." The mode of blistering mentioned, when speaking of the treatment of nephritis, may, perhaps, be safely adopted in this affection. Considerable advantage is said to accrue from the repeated injection of mucilaginous fluids into the bladder, by obtunding the acrimony of the urine, and soothing irritation.

Sect. III.—*Chronic Cystitis.*

Chronic inflammation of the inner membrane of the bladder is not an uncommon affection, and is generally described under the name of *cystirrhœa*. In some instances, this affection is the consequence of acute cystitis; but it may arise, at once, from the action of the same causes which produce acute inflammation of the bladder. The symptoms which accompany chronic mucous inflammation of the bladder, are—slight lancinating pains, attended with a sense of heat or burning in the region of the bladder, and a feeling of weight and tenderness in the perineum; frequent and harassing desire to pass urine, with occasional spasmodic action of the bladder and urethra. The urine is loaded with more or less of a tenacious mucous. Slow fever generally attends, accompanied with thirst, general debility, "particularly about the back and loins," and, in protracted cases, much emaciation and exhaustion. There is generally considerable derangement of the digestive functions; loss of appetite; sometimes nau-

sea and vomiting; costiveness; tongue covered with a white or brown fur; and the skin is harsh and dry. "In slight and incipient cases of this affection, the urine, when first passed, generally appears of a whitish color, and is more or less opaque and turbid, with the appearance of flocculi floating through it. On standing, however, for some time, it becomes more or less transparent, and the mucus will be found together in a mass at the bottom of the vessel." (Prout.) The writer just quoted states, that in most cases the urine is *acid;* others assert, that it commonly exhales an ammoniacal odor, and that it is rarely acid. In some cases, the quantity of mucus discharged with the urine "is enormous, amounting, occasionally, to several pints in the day; and in this case it not only comes away diffused through the urine, but also in the form of large coagula, which, by blocking up the urethra, give origin to the most distressing symptoms—particularly to a sense of severe burning pain along the whole course of the urethra."—Sometimes this mucus is easily diffused in water of the urine; but in inveterate and violent cases, it is so extremely tenacious, as to make it very difficult to mix it with the urine. When suffered to cool, the mucus, says Prout, is sometimes so tenacious "that it may be drawn into strings of considerable length, and the vessel may be frequently inverted without its falling out." In the worst cases, particularly when ulceration of the inner surface of the bladder exists, copious discharges of blood, at times, take place. I have known an instance of this disease, which continued for five or six years, and at last terminated fatally, from the supervention of acute inflammation in consequence of irritating injections.—In this case, more or less hemorrhage occurred from the bladder almost every month. The discharge of mucus was always very considerable. On dissection, two large ulcers of the mucous membrane were found near the neck of the bladder. Dr. M'Dowell found, in this affection, the mucous surface of the bladder to present "different degrees of vascularity, from merely a few patches of a dark or bright red color, to an entire vascularity, in some cases so marked, as to appear as if the bladder had been daubed over with blood; the veins, in general, are turgid; the membrane much thickened; frequently numerous ulcers occur, covered with a tenacious brownish-colored lymph; these are sometimes deep and numerous, so as to give a honeycomb appearance to the membrane. The inflammation sometimes ends in complete sphacelus of the interior of the bladder."* "Blood," says Dr. M'D., "is often discharged in very large quantity; and together with the abundant mucus, a white powdery sediment, or sanious matter, is mixed with the urine."

This affection is most apt to occur in old and gouty subjects; and persons of an irritable and scrofulous habit are said to be particularly predisposed to it, "more especially if they have been accustomed to free living, or been given to venereal excesses, or have suffered from these affections or gout."

Treatment.—In the early stages of the complaint, we must endeavor to reduce the chronic inflammation by local, depleting, and counter-irritating measures. Cupping along the loins, with the occasional application of leeches to the perineum, and about the anus, may be accounted our most efficient remedies during the first period of the disease. If the pulse is active, and the pain in the pelvis considerable, general blood-letting may be very beneficially resorted to. The bowels must be kept in a relaxed state by the occasional use of gentle purgatives, such as castor oil or magnesia. I have known much benefit to result from a caustic issue on the upper and inner part of the thigh. Advantage would probably be derived also from frictions and pustulation with tartar emetic ointment on the upper part of the thighs, or on the loins. When the inflammatory symptoms have subsided, either in consequence of the application of the remedies just stated, or by the long continuance of the disease, astringents, with some of the narcotic extracts, may be resorted to with a prospect of advantage. Dr. Prout prefers the uva ursi to all other articles of the astringent kind in this affection.

* Dublin Transactions, vol. iv.

"Given in combination with hyoscyamus, and steadily persevered in *for a considerable time*, the uva ursi seldom fails to diminish the irritation and quantity of mucus, and thus to mitigate the patient's sufferings." Within the last five or six years, the *buchu* leaves (diosma crenata) have been strongly recommended to the profession as a valuable remedy in this and other chronic affections of the bladder.* Dr. M'Dowell employed it successfully in three cases, according to the following formula:

℞.—Infus. buchu ℥vii.
Tinct. ejusdem.
Tinct. cubebæ āā ℥i.—M. S. Take an ounce of this mixture three times daily. The use of this remedy should be continued for three or four months.

I have heard of the successful employment of an infusion of the *pipsissewa* (chimaphila umbellata) in a case of this disease. In several inveterate cases I have prescribed the muriated tincture of iron, with infusion of peach-leaves, with very manifest benefit. In one instance, a perfect cure was effected by the tincture of iron, in conjunction with uva ursi. Frictions over the groins and the hypogastrium, with camphorated oil, have appeared to me serviceable in some cases. Besides these, a great variety of other remedies have been recommended for the cure of the affection. Balsam copaiva; turpentine; balsam Peru; camphor; madder, and many of the vegetable astringents, are mentioned by writers as often beneficial in this complaint. From the known good effects of balsam copaiva in chronic inflammation of the mucous membrane, there is some reason to presume that advantage might be obtained from its use in this complaint. Experience does not, however, furnish us with much testimony in its favor. I have given it in a few cases, but in these it appeared to give additional uneasiness in the bladder, without diminishing the mucous discharge.

Different kinds of injections into the bladder have also been recommended as beneficial in this affection; such as flaxseed tea; infusion of marsh-mallows; or barley-water. When retention of the urine occurs from a spasmodic constriction of the neck of the bladder, relief will often be obtained from seven or eight drops of the muriated tincture of iron given every half hour. The diet should be simple and digestible, and every kind of stimulating beverages carefully avoided. Fatiguing exercise, or riding on horseback, or in a carriage over rough roads, usually aggravates the symptoms. The drink should be bland and mucilaginous. One patient under my care always felt himself much relieved by drinking the infusion of the *malva rotundifolia*, a common plant in this country. I have also prescribed the constant use of slippery elm bark tea with beneficial effect.

Sect. IV.—*Hysteritis.—Inflammation of the Womb.*

Acute inflammation of the uterus generally occurs in the puerperal state, and usually within a few days after parturition. Sometimes this affection commences with rigors, succeeded by fever, before any pain is experienced in the uterus; and at others, more or less severe pain in the region of the uterus is the first intimation of its occurrence. The characteristic symptoms of the disease are: a fixed, continuous, lancinating, or a dull and aching pain in the pelvis, greatly increased by pressure or motion, and accompanied with a sense of weight or bearing down in the perineum. The urine is generally passed with much pain and difficulty, and in some cases a total retention takes place. This is particularly apt to be the case when the anterior and lower portion of the womb is inflamed. When the inflammation is chiefly located in the posterior part of the uterus, the

* [It often happens that in cases of chronic cystitis the bladder is paralyzed, or at least partially so. In such cases no relief can be afforded until a large catheter is repeatedly introduced. The lower portion of the spine should be irritated by tartar emetic plasters, and the use of appropriate diuretics and tonics persevered in.—Mc.]

pain is particularly severe in the region of the sacrum, and the patient experiences much pain, and often tenesmus, in evacuating the bowels. Sometimes the pains extend to the iliac regions, to the hips, and down the thighs to the knees, and even to the feet. When the pains extend to these parts, the lateral portions of the womb are usually the principal seat of the inflammation.

In the early period of the disease, little or no swelling of the abdomen occurs, but on examining the pubic region externally with the hand, the uterus is always found considerably enlarged, firm, and exceedingly tender to the touch. In those cases that occur soon after delivery, the pain in the pelvis generally becomes much increased, at times, in consequence of the occasional contraction of the uterus, and may be mistaken for severe *after-pains*. To distinguish the inflammatory pains from the latter, however, it is only necessary to bear in mind that the former are always continuous, though occasionally aggravated, whereas the after-pains are intermitting.

In the majority of instances, the system generally sympathizes strongly with the inflamed organ. In the early period of the disease, nausea, with occasional vomiting, occurs;*—the pulse, in some cases, is full, strong, and hard; in other instances, it is small, contracted, quick, and frequent. Severe headache is a very common attendant, and towards evening, and at night, more or less delirium usually occurs. In a great majority of cases, the lochia are entirely suppressed; in some instances a slight lochial discharge continues throughout the disease, and occasionally, though extremely seldom, this evacuation is even profuse. In general, the secretion of milk is somewhat diminished, but it rarely becomes entirely suppressed, as in puerperal peritonitis. In some cases of hysteritis, indeed, the breasts, remain full and turgid with milk, during the whole course of the disease. The bowels are generally inactive, and the urine is small in quantity, of a deep red color, and usually passed with much difficulty and pain.

The course of hysteritis is generally rapid. If, after four or five days' continuance, it does not tend to resolution, it will most probably terminate in suppuration or gangrene. By a vigorous antiphlogistic treatment, however, the violence of the inflammation may often be broken down in the course of the first twenty-four hours, and resolution speedily established. When the inflammation tends to this favorable termination, the pain, tenderness, and swelling of the uterus abate—the pulse becomes slower, soft, and open; the skin relaxed and moist; the tongue clean and humid; and the headache and general uneasiness gradually disappear. The lochia, also, usually begin to flow more freely, and the urine becomes more copious and natural in its appearance.

The occurrence of suppuration in the substance of the uterus is always attended with great danger. If the abscess bursts into the cavity of the peritoneum, or makes its way between this membrane and the external surface of the womb, into the cellular texture of the lower part of the pelvis, the issue will almost inevitably be fatal. Sometimes the abscess opens into the uterus, and the matter is discharged by the vagina. When the pus is evacuated in this way, the probability of a favorable termination will be very considerable. I have seen an instance where the uterus abscess formed adhesions with the peritoneum in the groin, and, after three weeks, the tumor was opened externally, and exit given to the matter. This patient finally recovered her health. Raiman states, that the abscess has, in some instances, burst into the bladder,† and cases are related, in which the matter was evacuated through the rectum. The occurrence of suppuration may be suspected, when, after an obstinate course of the disease, for five or six days, the pains become less severe, with a feeling of weight in the

* Dr. Dewees observes, in his account of the symptoms of this affection, that "the stomach is rarely much affected in the early part of the disease—at least vomiting seldom takes place." This does not accord with my own experience. In all cases of unequivocal hysteritis I have ever met with, nausea, with occasional retching, occurred during the early period of the malady.

† Handbuch der Speciellen Med. Pathologie, &c., b. i. p. 358.

affected part, at the same time that the pulse becomes more frequent, attended with occasional slight chills; irregular distribution of heat over the body—some parts being cool while others are hot; irregular, partial, and cool sweats; fetid, and more abundant lochia; prostration of the muscular power; dry and red tongue, and a livid flush on one or both cheeks.

The termination in gangrene is not a frequent event in this affection, unless the peritoneum be implicated in the inflammation. The supervention of gangrene will be readily perceived by the occurrence of the usual symptoms of mortification. A rapid cessation of the pain; great muscular prostration; dimness of vision; a death-like countenance; a profuse, cold, and clammy sweat; ice-cold extremities; and an extremely small, weak, and rapid pulse, announce the occurrence of gangrene, and the inevitable doom of the patient.

The foregoing description applies to hysteritis in its simple or unmixed form—that is, inflammation of the proper substance of the uterus, without implicating its peritoneal covering in the disease. In many instances, however, the inflammation spreads to the peritoneum, an extension of the local affection frequently met with in the worst forms of what is usually called *puerperal fever*. Cases of this kind almost invariably prove fatal. The extension of the inflammation from the substance of the uterus to the peritoneum, is attended with an increased frequency of the pulse, tumefaction, and great tenderness of the lower part of the abdomen; entire suppression of the lochia, "or an excessive discharge of them," (Dewees;) cessation of the secretion of milk; great prostration of the muscular powers; frequent muttering delirium; constant recumbence on the back, with the knees drawn up and raised, and the shoulders elevated, to take off the tension of the abdominal muscles; a dry, coated, and brown tongue; and, towards the end, usually, diarrhœa. Cases of this kind are always rapid in their progress, and unless the inflammation be speedily subdued by prompt and energetic measures, collapse of the vital energies generally supervenes in forty-eight hours, and often sooner, from the time the peritoneal inflammation commences.

Treatment.—The most efficient antiphlogistic means must be promptly and energetically pursued in the treatment of this affection. As soon as possible after the commencement of the inflammation, blood should be drawn from a vein to the extent of producing a very decided impression on the circulation, or an approach to syncope. If, after the first efficient bleeding, the pulse rises again, and the pain and tenderness of the parts are not materially abated, venesection should be repeated, and again to the extent of causing a very manifest reduction of the momentum of the circulation. When the activity of the heart and arteries has been moderated by general bleeding, and the disease is not adequately subdued, leeches should be applied over the region of the pubes, and to the vulva and perineum. Immediately after leeching, a large emollient poultice should be applied over the lower part of the abdomen and the external organs of generation; and this application should, from time to time, be repeated, until the violence of the local affection is in a great measure subdued. Dr. Dewees objects to the use of fomentations to the abdomen in this affection, and asserts that they have done mischief. I have no experience with any applications of this kind, in the present malady, except emollient poultices applied after efficient venesection and leeching; and to me it has always appeared, that very evident advantage was obtained from this application.

Purgatives are, in general, highly useful in hysteritis. Calomel, in doses of from eight to twelve grains, followed in the course of four hours by a full dose of Epsom or Glauber's salts, will answer this purpose very well. After the first active purgative, two or three evacuations should be procured daily by the exhibition of small doses of calomel and of the neutral purgative salts. Irritating purgative enemata generally aggravate the patient's sufferings, and should not be employed. I have, however, known unequivocal benefit derived from injecting into the rectum, from time to time, warm emollient fluids—such as warm water and milk—decoction of althea—infusion of flaxseed—or simply warm water.

In a case which I attended about two years ago, the patient was much relieved by injections of this kind. They are particularly beneficial in the declension of the disease.

Blisters are much recommended by some writers; but Dr. Dewees thinks their usefulness is very doubtful. From my own experience, I am disposed to ascribe considerable value to vesication in this affection. When employed, after the momentum of the circulation has been moderated by general and local bleeding, I am well satisfied that blisters will often do much good in this complaint. If after leeching we apply an emollient poultice over the lower part of the abdomen and vulva, and blisters to the upper and internal part of the thighs, much advantage will in general result.

Some benefit may also be obtained from the usual antiphlogistic diaphoretic remedies. Nitre, antimony and calomel in combination, form an excellent compound for this purpose. The muriate of ammonia, as prescribed under the head of intermitting fever, is a favorite remedy with many of the German physicians, and I am inclined to think that it is very worthy of attention in this respect.

Opium, in full and frequent doses, and in union with calomel, is a valuable remedy in this affection. Dr. Dewees, however, "thinks that in this, as well as in all diseases of high inflammatory action, opium is decidedly hurtful." My own experience has led me to a very different opinion. The powers of this narcotic in inflammatory affections are not, as yet, sufficiently appreciated. That opium is not hurtful, "in all diseases of high inflammatory action," but often highly beneficial, is admitted by many of the ablest practitioners of the present day. When given in active doses, and repeated so as to keep the system constantly under its full influence, it often contributes, in a powerful degree, to the reduction of the local and general phlogistic actions. By lessening the general irritability and sensibility of the system, the different organs and structures become less susceptible of the stimulus of the local inflammation, and all the sympathetic actions consequently abate in their violence; and, in like manner, by diminishing the morbid sensibility, and pain of the affected part, the inflamed capillaries will be more disposed to resume their healthy functions. Opium does not, generally, increase the momentum of the circulation, in fevers *depending on local inflammation*. I have frequently known, in violent cases of acute rheumatism, a full dose of opium to render the pulse less frequent, and much softer than it was before its exhibition. As this article, however, has a strong tendency to cause cephalic congestion, and may do injury in this way, where the system is plethoric, or the action of the heart and arteries very vigorous, it will always be best to delay its exhibition, until blood has been efficiently abstracted. When this has been done, and the bowels well evacuated, from one to two grains of opium, with the same quantity of calomel, may be given every three or four hours with the happiest effect in the present disease.

Sect. V.—*Chronic Inflammation of the Uterus.*

Chronic inflammation of the uterus appears to be a very common affection; and, though frequently productive of very distressing consequences, is often misunderstood and consequently mismanaged.

This affection is frequently the result of difficult or instrumental labors; and Mr. Guilbert observes, that it often arises from excessive venereal indulgence, and from rheumatic and gouty irritation. He mentions, also, translation of erysipelas as a frequent cause of the disease; and it supervenes occasionally, in consequence of the final cessation of the menses, at the critical period of life, and even as the result of temporary amenorrhœa. Chronic inflammation of the womb sometimes occurs in a periodical manner, and this is most apt to be the case when it arises from erysipelas. Mr. Guilbert says, that females who do not suckle their infants, are more liable to this variety of uterine disease than those who perform this interesting maternal function.

Chronic inflammation sometimes affects the whole body of the uterus; but much more frequently, it is seated in the neck or mouth of this organ. Out of a hundred cases, says the author just mentioned, there will, probably, not be ten in which the inflammation is not almost exclusively seated in the neck and mouth of the womb.

Many females affected in this way, either mistake their complaint, or conceal it; or from the slightness of their sufferings neglect to resort to medical aid, until serious, and often irremediable structural disease is established. Some experience only a sense of heat, with slight soreness in the lower part of the pelvis; others complain of dull or lancinating pains in the region of the womb, with occasional intermissions and exacerbations. In some cases a sense of weight is felt, as if the uterus were prolapsed, attended with occasional pains in the upper part of the vagina. In all instances, more or less of a leucorrhœal discharge attends; and when, at times, the inflammation is aggravated, this discharge becomes white and opaque, or purulent. Those who are affected in this way are apt to experience considerable pain at the superior part of the vagina, during the venereal embrace; and, in some instances, the tenderness of the os uteri is so great, that the venereal act always causes extreme suffering.

On examining per vaginam, the mouth of the womb is found irregularly enlarged, one side or lip being usually much swollen, and very tender to the touch. So great is the sensibility of this part, that the patient experiences severe suffering from the slightest touch of the finger on making the examination. In general, the mouth of the uterus is diverted from its regular position in the vagina, and directed to one side, or sometimes to the posterior or anterior part of the pelvis. If the disease has been of long standing, the engorgement, or swelling of the neck of the womb, is so great as to form a large tumor embraced by the vagina. More or less pain in the back and loins occurs in nearly all cases; and the stomach usually sympathizes with the uterus, so as to give rise to a train of very harassing dyspeptic and nervous symptoms.

In some cases the inflammation continues for years, without the occurrence of any serious structural disorder of the womb; but in the majority of cases, the neck of this organ gradually enlarges, and becomes indurated, or scirrhous, and finally often terminates in cancerous ulceration.

Many cases that are usually regarded as simple leucorrhœa, are connected with chronic inflammation of the os uteri; and it is hence especially important, when called to prescribe for morbid vaginal discharges of a leucorrhœal character, to ascertain, by examination, the state of the neck and mouth of the uterus. The existence of inflammation and tumefaction may be suspected, when, with a puruloid vaginal discharge, the patient complains of heat, weight, soreness, or pain in the upper part of the vagina.

Treatment.—When the pulse is irritated, or quick, frequent, and somewhat tense, it will, in general, be proper to draw blood from a vein—and this measure is particularly proper when the patient is of a robust and plethoric habit. The diet should be unirritating and digestible, and where the diathesis is manifestly phlogistic, the nourishment should be of the lightest kind, until the general irritated condition of the system is removed. When there is reason to believe that the bowels are loaded with feculent matter, a few active purgatives ought to be administered in the beginning of the treatment; but after the intestines have been thus thoroughly evacuated, small doses of some of the neutral purgative salts should be given two or three times a week, so as to keep up a gentle and regular action of the bowels. Much benefit is sometimes derived from the application of leeches to the perinæum, and about the anus and vulva, or even to the region of the pubis. M. Guilbert, in the work referred to above, speaks in the most favorable terms of the efficacy of leeches applied to the os uteri.* He has in-

* Considerations Pratiques sur les Affections de l'Utérus. Par J. N. Guilbert, M. D., &c. Paris, 1826.

vented a speculum uteri, by which, he says, the application of leeches to this part is very easily effected; and he has given the history of several cases, in which this practice was adopted with prompt and complete success. That local depletion, in this way, is likely to do much good, we cannot doubt.* In private practice, however, it would be difficult to induce patients to submit to this treatment; and there are few practitioners, I apprehend, who would be willing even to propose this measure, unless the urgency of the case were extremely great.

Cupping above the pubis, and blisters applied to the sacrum, or to the internal surface of the thighs, will sometimes contribute materially to the reduction of the uterine inflammation. Some advantage may also be obtained from warm emollient injections into the vagina, but all astringent and exciting applications of this kind ought to be carefully avoided, with the exception, perhaps, of a very weak solution of sugar of lead.†

Internally we may employ small doses of balsam copaiva, but its use must be delayed until the measures already mentioned have, in some degree, moderated the local and general irritation. I have, in a few instances, derived considerable benefit from the internal use of the muriate of ammonia, in twenty grain doses three times daily. When this article is dissolved in water, with a considerable portion of the extract of liquorice, it will, in general, be readily taken by patients; but without the addition of the liquorice, it is so extremely offensive to the taste, that very few are willing to employ it.

If, after the inflammation, or the pain, tenderness and swelling of the neck or orifice of the womb are removed, a leucorrhœal discharge continues, it must be treated according to the directions given under the head of leucorrhœa.

CHAPTER XIV.

OF THE PHLEGMASIÆ OF THE SANGUIFEROUS SYSTEM.

Pericarditis.

Inflammation of the pericardium is no very uncommon affection, and from the very important functions assigned to the parts immediately implicated, must be regarded as one of the most alarming and dangerous of phlegmasial diseases.

The *symptoms* which usually attend the *acute* form of the disease, are—sudden severe lancinating pains in the centre or cardiac region of the chest, extending occasionally to the epigastrium, or to the back between the shoulders, attended with more or less oppressive dyspnœa, palpitation of the heart, and a sense of weight and constriction under the sternum and left side of the thorax. Pain in the præcordial region, obscurity of sound in this region on percussion, and irregularity of the pulse, are the most constant symptoms of this affection. M. Louis asserts that from the concomitance of these symptoms, this affection may be

* [My ingenious friend and former pupil, Dr. Dodd, of the U. S. Navy, has invented an instrument for cupping and scarifying the os uteri as well as other internal parts, which promises to be exceedingly advantageous. It consists of large glass or flexible metallic tubes, containing a scarificator, and connecting with an exhausting or air pump syringe.

I have derived the greatest success, however, from the repeated application of the solid nitrate of silver around and just within the orifice of the os tincæ. The use of a speculum, although very convenient and satisfactory in extreme cases, is by no means necessary in the performance of this operation.—Mc.]

† The hip-bath—general warm bathing. Mild mercurial course, avoiding ptyalism; a few grains of blue pill, with two grains of camphor, and one-tenth tart. antimonii.

recognized in about half the cases in which it occurs. In most instances the patient is entirely incapable of lying down, more especially on the left side. He is constrained to remain, almost immovably, in the sitting posture, leaning the body slightly forwards, and resting his head on the back of a chair or some other sufficiently elevated support. The slightest variation from this posture, unless very cautiously effected, is apt, in some cases of this kind, to give rise to sudden and most poignant pains in the region of the heart. Extreme præcordial anxiety, with a dry and short cough, usually attend; and in many instances, partial syncope or sudden feelings of great faintness occur, at intervals during the progress of the disease. Along with these symptoms we have also strong evidence of cardial disturbance in the state of the pulse. In most instances the pulse is remarkably irregular, intermitting, frequently feeble, and sometimes so small as to be almost imperceptible. A few cases, indeed, have been recorded in which the pulse remained in nearly a natural state. Tacheron relates an instance of this kind.* The face is generally pale, with an occasional circumscribed flush on one cheek; the prolabia become more or less livid as the disease advances, and a slight puffy swelling is apt to occur about the eyes and temples. The hands and feet usually become slightly œdematous in the latter stage of the disease; and great general weakness almost always ensues soon after the full development of the inflammation. The speech is commonly faltering, and in some cases the patient is unable to spit out, without giving rise to sudden and extremely severe darting pains in the region of the inflamed organ. Sometimes considerable headache attends, and occasionally much uneasiness and pain are experienced in the stomach, accompanied with tenderness to pressure in the epigastrium.

It must not be supposed, however, that pericardial inflammation is invariably attended with the train of symptoms just described. There are few phlegmasial affections so liable to such remarkable variations in the attending symptoms, as the disease under consideration. In some cases very little or no pain is experienced in the region of the heart; and the disturbance of the heart's action varies greatly in different cases, or at different stages of the same case. Most commonly the heart palpitates tumultuously, and knocks violently against the ribs; but in some cases, its action is so feeble that its pulsations are scarcely to be felt or heard. Although the majority of patients are obliged to remain in a sitting or semi-recumbent posture, yet some are forced to lie immovably on their backs, or on the right or left side. "But the strangest anomaly is, that the same patient who, at one period of this disease, has fixed himself immovably on the left side, will, at another, be forced to turn over and fix himself as immovably on the right side." (Latham.)

Pericarditis is not unfrequently complicated with inflammation of the neighboring structures, as the pleura, lungs, mediastinum, diaphragm, or stomach; and in some cases, the substance of the heart itself participates in the pericardial inflammation. In instances of this kind, the symptoms are, of course, correspondingly complex.

Diagnosis.—From the complications just mentioned, the diagnosis of pericarditis is often attended with much difficulty; and Laennec cautions, in all instances, against "too implicit a confidence" in the symptoms mentioned above as manifestations of pericardial inflammation. Pericarditis, he says, may exist without any of these signs; and on the other hand, all of them may be present, without the slightest inflammation of the pericardium. M. Louis, however, asserts, that from a careful observation of the thirty-two cases of this affection, he has been led to believe that the diagnosis is by no means so difficult and uncertain as is supposed by Laennec and others. This, he says, may be asserted, at least, of those cases that are free from complications. Where we find severe lancinating pains in the region of the heart, extending at intervals to the back and epigastrium, attended with palpitation of the heart; great irregularity, intermission, and small-

* Recherches Anatomico-pathologiques, &c. &c.

ness of the pulse; difficult respiration; occasional syncope or great faintness; inability to rest in the recumbent position, with more or less œdema of the extremities, we may infer, without much risk of erring, the existence of pericardial inflammation. If with these symptoms we find the cardiac region yielding an obscure or dull sound, on percussion, while the other parts of the chest are resonant, the correctness of the diagnosis will hardly admit of a justifiable doubt. But, although we may, with but little risk of mistake, infer the existence of pericarditis when the foregoing symptoms are present, it is well ascertained that rapid and violent pericardial inflammation sometimes occurs, and proceeds to a fatal termination, without at any period of its course manifesting a single symptom indicative of cardial disease. It is a very remarkable fact, also, that cases of this kind occasionally simulate inflammation of the brain so closely, that no one could for a moment hesitate to regard the disease as an instance of strongly-marked encephalic inflammation. Dr. Latham has recorded several highly interesting cases of this kind. "One of the children at Christ's Hospital, had, in the opinion of all who saw him, the severest inflammation of the brain. The attack was sudden, with great heat of the skin and frequency of the pulse. He had delirium and convulsions, and pointed to his head as the seat of the pain." On dissection, not the slightest trace of inflammation within the head was discovered, but the heart and pericardium were intensely inflamed. M. Andral also relates a case where delirium, general convulsions, twitching of the tendons, and finally tetanic spasms, followed by paralysis of the upper extremities and fatal coma, occurred without the least sign of any particular affection of the head. On dissection, the brain, spinal marrow, and their membranes, did not present the slightest traces of disease. But the pericardium exhibited strong marks of inflammation; its surface was covered with a layer of concreted lymph, and several ounces of a green and flaky serum were effused into its cavity.*

Causes.—In general, whatever is capable of causing inflammation of any of the thoracic organs or structures, may give rise to pericarditis. Cold, mechanical injuries, the sudden healing up of old ulcers, the suppression of habitual evacuations, repelled cutaneous affections, the influence of the depressing mental emotions, and over-exertion of the mind may produce the disease. Metastasis of *rheumatism* and gout is, however, by far the most common cause of this affection. Rheumatic irritation, especially, is frequently concerned in the production of cardiac affections. Under the head of hypertrophy, its tendency in this way will be particularly noticed. Pleuritis and pneumonia sometimes involve the pericardium.

Autopsic phenomena.—In most instances a considerable quantity of serum is found in the percardium. Louis mentions cases in which more than a pint and a half of reddish or yellowish serum was collected; and Corvisart saw an instance where it amounted to four pounds. The internal surface of the pericardium is generally much injected, and often rough and uneven, or covered with more or less extensive patches of false membrane. In some cases a similar pseudo-membranous formation covers the surface of the heart. M. Louis mentions one where false membrane, nearly half an inch thick, in some places, covered the heart, so as to give it the appearance of the rind of a pineapple. Laennec asserts that the quantity of serum effused into the pericardium, though considerable in the early stage of the disease, always decreases progressively, by absorption, as the violence of the inflammation declines. In cases of great violence there is generally very little or no serum effused; but instead of this, a large portion of firmly concreted albumen usually covers the heart and internal surface of the pericardium, and in some instances fills the whole cavity of this membrane, uniting it more or less firmly with the surface of the heart.† In cases

* Pathological Essays on some of the Diseases of the Heart. By P. M. Latham, M. D., Physician to St. Bartholomew's Hospital.—*Lond. Med. Gazette*, 1829.

† Laennec.

that terminate favorably, this albuminoid concrete matter gradually becomes converted into cellular substance, "or rather into laminæ of the same nature as the serous membranes." In some cases the pericardium is found very firmly adherent to the heart throughout its whole extent, by means of laminæ of cellular structure thus formed. Cases are mentioned by some of the older writers, where the pericardium was supposed to be altogether wanting; but these were, no doubt, instances of the firm adhesion of this membrane to the heart. Columbus relates the case of a student at Rome, who, after having for a long time suffered frequent attacks of syncope, died suddenly. On dissection, the heart, he says, was found unprotected with a pericardium.* The pericardium has also been found affected with true scirrhous induration; and Dr. Friend asserts that he has found it above half an inch in thickness throughout its whole extent.†

Chronic Pericarditis.—The chronic form of pericardial inflammation appears to be much more frequent than the acute. It is attended, in most instances, with more or less fixed pain in the region of the heart, subject to occasional exacerbations, particularly from even slight perturbating causes. Some degree of dyspnœa and pectoral oppression is seldom wholly absent; and a short dry cough is apt to occur. The pulse, as in the acute form of the complaint, is small, and at times irregular and intermitting; and the heart is apt to be thrown into violent paroxysms of palpitation by slight corporeal exertions and mental excitement. Patients laboring under this affection are generally timid, pusillanimous, and disturbed by apprehension of evil, or of death. On percussion, the sound elicited over the region of the heart is peculiarly dull; and when effusion has taken place some degree of fluctuation may be felt by the patient. In most instances œdema of the lower extremities occurs, and occasionally a puffy swelling appears suddenly in the face, particularly under the eyes, and after a day or two disappears again.

When the sound on percussion over the cardial region is dull, and the extremities and face become puffy, we may conclude that considerable effusion of serum has taken place in the pericardium; and in this case the danger is always very great. Death from this affection often occurs very suddenly and unexpectedly; but in some instances a slow wasting of the body, and declension of the vital powers, under symptoms of general febrile irritation, gradually lead to a fatal termination.

On dissection, the whole internal surface is, usually, found florid; but the pseudo-membranous exudation, so common and conspicuous in acute pericarditis, is but rarely met with in this form of the disease. When albuminoid concretions of this kind do occur in chronic pericarditis, they are always "thin, soft, friable, and entirely resembling a layer of very thick pus." (Laennec.) The substance of the heart presents a whitish color, "as if it had been macerated, several days, in water;" and it is sometimes of a much softer consistence than natural, whilst in other instances it possesses its normal degree of firmness. Laennec does not agree with those who suppose that the loss of color in the muscular substance of the heart, is the consequence of inflammation; but he does not advance any facts which can be deemed sufficient to repudiate this opinion.

Treatment.—A direct and active antiphlogistic treatment is of course the only mode of management upon which any reasonable hopes of success can be placed. In cases attended with symptoms of pulmonic inflammation, the treatment should, in every respect, coincide with that which would be adopted in either pneumonia or pleuritis. Where the pericardial inflammation has supervened suddenly, soon after the disappearance of external *rheumatic* inflammation, blood-letting cannot, in general, be carried to the extent which is proper in cases arising from other causes. Indeed, the ordinary antiphlogistic means usually employed in phlegmasial affections, will rarely subdue rheumatic pericarditis; and copious abstrac-

* De Re Anatomica, lib. xv. p. 267—as quoted by Van Swieten.
† History of Physic, p. 2.

tions of blood are not unfrequently productive of serious mischief. In cases of this kind *calomel* and *opium*, given in full and frequent doses, in conjunction with moderate general and local depletion and proper revulsive applications, constitute the most valuable curative means we possess. Dr. Latham speaks in the most favorable terms of the employment of mercury in pericarditis. It is particularly valuable in rheumatic pericarditis, although much advantage may often be obtained from its use in every variety of the disease. "From acute pericarditis," says Dr. Latham, "which has proceeded to the deposition of lymph, nothing, I believe, can effect a perfect recovery, except *mercury*, given so as to excite moderate salivation." From my own observations, I am entirely convinced that calomel given to the extent of producing a general mercurial impression, is a valuable remedy in this affection. Where the disease is dependent on rheumatism, it will, I think, always be best to give the calomel in union with opium. In a case of rheumatic pericarditis, which came under my care about six months ago, I prescribed one grain of opium with three grains of calomel, every four hours, with unequivocal benefit. About sixteen ounces of blood were abstracted with the lancet, and thirty leeches applied to the region of the heart, before the calomel and opium were resorted to.

Blistering on the back between the shoulders, whilst blood is abstracted by leeching or cupping from the anterior cardial region, is a very powerful auxiliary in reducing this affection. The saline hydragogue purgatives are probably better suited to procure advantage in this affection than the other articles of this class of remedies. From what I have myself witnessed in relation to this point, I am led to believe that cremor tartar, with or without a portion of jalap, is the best purgative we can give in this affection. When the disease is of a chronic character, and there is reason to presume that serum has been effused in the pericardial cavity, diuretics will be proper. The squill, in union with calomel, may be employed for this purpose. In this form of the disease, a more permanent counter-irritation over the region of the heart, than can be well obtained by blisters, should be kept up. Pustulation with the tartar emetic ointment, or a caustic issue, will in general answer this purpose well.

CHAPTER XV.

OF THE PHLEGMASIÆ OF THE FIBROUS AND MUSCULAR STRUCTURES.

SECT. I.—*Acute Rheumatism.*

ACUTE rheumatism generally commences with the ordinary initial symptoms of febrile affections from cold or atmospheric vicissitudes. A sense of chillness, alternating with flushes of heat, with general lassitude, loss of appetite, and depression of spirits, are the usual symptoms which attend the development of the disease. In many instances, a general soreness and aching of the body accompany these symptoms. Sometimes the febrile reaction becomes completely established before the local rheumatic inflammation supervenes; in other instances, more or less pain is experienced in one or several joints, or in other fibrous structures, from the commencement of the attack; and occasionally, though rarely, the local affection occurs before any manifest general sympathetic irritation takes place. The parts affected with rheumatic inflammation are swollen, red, and extremely painful—the slightest pressure or motion causing the utmost degree of suffering. When perfectly at rest, the patient often experiences some abatement of the gnawing and tearing pain during the day; but at night intense

exacerbations usually take place. Whether the fever precede or rise with the development of the local inflammation, it always acquires additional violence as soon as the local affection is fully established—the pulse becoming full, frequent, and vigorous; the skin hot and dry; the tongue coated with a white fur, changing to a brown color, as the disease advances; the thirst very urgent; the bowels constipated, and the urine scanty, of a deep red color, transparent, and without sediment. In very severe cases, headache, and, occasionally, slight delirium, attend during the exacerbations.

Bilious Rheumatism.—Acute rheumatism is sometimes complicated with conspicuous derangement of the biliary organs. This is the *rheumatismus acutus gastricus* of Richter, and depends, according to Stoll, on gastric irritation from redundant and vitiated bile in the primæ viæ.* Like *bilious pleurisy*, it is the result of the united operation of cold and koino-miasmata on the system. This variety of the disease is met with in miasmatic districts, during the cold and variable months of the year, more especially after a warm and sickly autumn. The disease is usually attended with considerable pain in the head; a yellowish or icterode hue of the eyes; a thick layer of brown fur on the tongue; occasional nausea and bilious vomiting. The quantity of bile thrown up is sometimes very great; and after each spell of vomiting, an immediate and often almost complete, though but temporary, abatement of the local rheumatic pains usually occurs.

Gonorrhœal Rheumatism.—Rheumatic pain and swelling of the knees and ankles, are no uncommon consequences of gonorrhœal irritation. In some instances, though rarely, the rheumatic affection becomes more general, very painful, and attended with very considerable febrile irritation. Cases of this kind have generally been ascribed to a suppression of the gonorrhœal discharge. This is the opinion of Brodie, and of Swediaur; but Mr. Bacot thinks this explanation of its origin "is to be understood in a very qualified sense." It appears, however, to be pretty well ascertained, that "neither the affection of the joints nor the more general rheumatism, comes on until the gonorrhœa is on the decline." Young persons of "strumous habits, florid complexions, and not particularly robust," are most liable to this form of rheumatic affection. This form of the disease is characterized by much puffiness and tenderness of the ankles, especially towards evening; the pain is not much increased by pressure—the stomach becomes deranged, and the appetite usually fails altogether. Now and then, "all the symptoms are suddenly relieved by an eruption of papulæ in clusters; or sometimes by pustules in minute patches." This eruption may continue from a few days to several weeks. When it appears, both the pains and constitutional symptoms go off entirely.†

The *rheumatismus non febrilis recens* of the German writers, though diverse from the *chronic* form of the disease, is not attended with very obvious symptoms of febrile reaction. It shows itself by more or less severe and sharp pain in some one of the muscular or aponeurotic parts of the body, particularly in the muscles of the breast, neck, and about the scapular region, and occasionally in the face and jaws. Sometimes the affected part is swollen and red; at others neither swelling nor redness occurs. This variety of rheumatic inflammation generally arises from the local application of cold, such as currents of air directed upon some particular part of the body.‡

Prognosis.—Although extremely painful, rheumatism is not a dangerous affection, so long as the inflammation remains in the external parts. When translated to some internal organ or structure—particularly to the heart, meninges of the brain, stomach, or lungs, the most serious consequences are to be apprehended.

* Ratio Meden., tom. ii. p. 25.

† A Treatise on Syphilis, &c., by John Bacot, Esq., Surgeon, &c.

‡ Richter, Specielle Thérapie, vol. ii. p. 36.

The duration of an attack of acute rheumatism is extremely various, and depends much on the degree of constitutional predisposition to the disease; and on the remedial management adopted for its removal. When the disease is about terminating, general diaphoresis, with a copious pale-red sediment in the urine, occurs; and, in some instances, moderate diarrhœa accompanies the declension of the fever and inflammation. It never terminates in resolution without the concomitant occurrence of diaphoresis and a lateritious sediment in the urine. It would appear from some observations of Dr. Chambers and Mr. Wigan, that the sweat in acute rheumatism is almost invariably of an acid quality.* I noticed this fact in a case I attended a few months ago. The patient wore a blue check shirt, the blue stripes of which were changed to a pale-red color during the resolution of the disease.

Rheumatism occurs but very rarely during early infancy. Scudamore asserts that infants are entirely exempt from it; but in this he is certainly wrong. I have met with several instances of acute articular inflammation, attended with the usual phenomena of rheumatism, in children under two years old. Very aged persons, also, are seldom affected with the *acute* form of rheumatism, although especially liable to the *chronic* variety of the disease. From the seventh to the forty-fifth year of age, is the period during which acute rheumatism is most apt to occur. Lean and muscular persons of a sanguineous temperament are, in general, much more liable to this affection than individuals of a fat and soft habit of body, or of a nervous or lymphatic temperament. Among the most common and powerful accidental predisposing causes of rheumatism are, derangement and irritation of the alimentary canal; the inordinate use of spirituous liquors; fatiguing exercise, accompanied with protracted and copious perspiration; and the habitual use of high-seasoned and heating articles of food; and the abuse of mercury.

Causes.—Suppressed perspiration from cold or sudden atmospheric vicissitudes is incomparably the most frequent exciting cause of rheumatism. It is on this account that the disease is so much more common during the damp, raw, and variable months of spring and autumn, than in the more mild and equable season of summer. Indeed, rheumatism is almost peculiarly a disease of cold and variable climates—its occurrence in the warm and more *uniform* latitudes being comparatively rare. Mercury is generally accused as a very frequent cause of rheumatism. It is doubtful, however, if it is ever, of itself, the exciting cause of this affection, although its very especial tendency to *predispose* the system to the morbific influence of low and variable temperature is unquestionable; and it is, probably, by this effect alone, that the use of mercury is so apt to be followed by rheumatic affections. I have already adverted to gonorrhœal irritation as an occasionnl cause of rheumatic affections. It would appear that the occurrence of the arthritic pains is in some way or other connected with the disappearance of the gonorrhœal discharge, but whether the cessation of the discharge is to be regarded as the effect or the cause of the rheumatic affection, is, as yet, a matter of conjecture.

In relation to the proximate cause of rheumatism, authors have expressed a variety of opinions. Formerly it was customary to regard the disease as depending directly on a peculiar morbific or *rheumatic* matter in the blood, which being thrown or concentrated upon some particular part, was thought to be the immediate exciting cause of local inflammation. Balfour advanced the opinion of its consisting in a peculiar inflammation of the cellular tissue; and Cullen supposed that an inflammatory state of the blood, in connection with a peculiar phlogistic condition of the muscular structure, constitutes the proximate cause of the disease. With Broussais, it, of course, is the consequence of the all-embracing *gastroenterite*. The opinion of Richter, that rheumatic inflammation is the consequence of irritation from *retained perspirable matter* (*materia perspirabilis*

* Medico-Chirurg. Rev., April 1828, p. 176.

*retenta**), though savoring too much of humoral pathology for the prevailing taste of pathologists, is at least as plausible as any other doctrine that has been advanced on this subject, and by no means at variance with the immediate effects of its acknowledged almost invariable exciting cause.

Whatever ideas may be entertained in relation to the proximate cause of rheumatic inflammation, it is now generally admitted that the seat of this inflammation is in the *fibrous texture*—more especially in the aponeurotic and tendinous structures of the body. It is manifest, moreover, that this inflammation differs very materially from the other varieties of inflammation; and the opinion of Scudamore, that it is, *sui generis*, of a strictly specific character, is supported by its peculiar character and phenomena. The frequent and often rapid passage of the local affection from one part of the body to another, would seem to indicate something radically distinct, if not in the inflammatory action itself, at least in its immediate or proximate cause. This circumstance, too, favors the opinion that the disease consists in a peculiar diathesis, or general morbid condition of the system—the local inflammation being merely one of its effects, or external manifestations. We notice this migratory character in all inflammations which depend on some internal or constitutional affection. It occurs most conspicuously in gout, and in some varieties of erysipelas.

Metastasis of rheumatic inflammation to internal organs or structures, and consequent alarming and sometimes fatal consequences, is by no means unfrequent. It may pass upon the heart, diaphragm, stomach, bowels, intercostal muscles, and, in short, upon almost every sensible part of the body. When it is translated to the heart, the patient is seized with acute pain and a feeling of great anxiety in the cardiac region, with *palpitation*, fits of partial syncope, and a pale, contracted, and distressed aspect of the countenance. Metastasis to the meninges of the brain, is attended with a sense of weight, and sometimes acute pain in the head, intolerance of light and sound, a wild and anxious expression of the countenance, occasional delirium, strabismus and impaired vision.† When the stomach becomes the seat of the disease, violent cardialgia, nausea, vomiting, indigestion, "and symptoms imitating cancer or scirrhus of the pylorus," usually supervene. Cazenave says, that in some cases, nothing but a feeling of coldness or pain occurs in the epigastric region.‡ The same writer states, that he has known the bladder to be affected with rheumatism—producing retention of urine, and much pain in the vesicle region. Sometimes the lungs become the seat of the disease, in which case symptoms of peripneumony supervene. When it attacks the intercostal muscles, or the pleura, the phenomena of pleuritis occur. Cazenave states, that he has repeatedly known rheumatic inflammation to fix upon the uterus and its appendices, giving rise to severe pain in this organ. I have lately seen an instance of sudden translation of rheumatic inflammation from the wrist to the bowels, in a young lady, which was speedily followed by symptoms of subacute peritonitis. On the fourth day the pain and swelling reappeared in the arm, and the abdominal affection speedily subsided. Dr. Johnson observes, in relation to this disease, that though not often fatal *as external rheumatism*, yet in *its consequences*, he is led, from "long and attentive observation," to regard it as being productive of "a very considerable proportion of those active enlargements or hypertrophiæ of the heart, which we now so frequently meet in practice." Dr. Cox also refers to the "numerous cases of organic disease of the heart and pericardium, which he met with during his connection with St. George's Hospital, that were referable to, or connected with, rheumatitis."§ His observations have led him to believe that the "majority of

* Specielle Thérapie, vol. ii. p. 18.

† Observations on Acute Rheumatism and its Metastasis to the Heart. By Thos. Cox, M. D. London, 1824.

‡ Memoir on the Treatment of Rheumatism. By Dr. Cazenave.

§ Loc. citat., preface, viii.

cases of organic disease of the heart in *young people*, are connected with rheumatism."

Diagnosis.—By the ancients, rheumatism and gout were generally described under the common name of *arthritis*, and it does not appear that they regarded these affections as being diverse from each other. The essential identity of these two diseases has, indeed, found advocates among modern pathologists, although the general sentiment, at present, is, that they are radically distinct from each other. The principal distinguishing circumstances between these two affections are:—1. The periodical recurrence of *gout* after it has once invaded the system; whereas, rheumatism does not possess this tendency, the patient often remaining entirely free from the disease during the rest of life, after having suffered an attack of it. 2. The distinct character of their causes; thus, rheumatism is conspicuously and almost invariably, the result of atmospheric inclemency or vicissitudes causing sudden depression of the cutaneous exhalation.* It is not produced, like gout, by indolence, in conjunction with the free use of vinous drinks, and rich, high-seasoned, and stimulating articles of diet. An attack of acute rheumatism is not usually preceded by uneasy sensations in the stomach, and other gastric disturbances. Gout is very often preceded by dyspeptic symptoms. 3. The predisposition to gout is often transmitted from parent to offspring. This is rarely, if ever, the case in relation to acute rheumatism. 4. Gout is most apt to occur in debilitated and relaxed habits; its occurrence in lean, muscular, and temperate persons inured to hardships and toil, being extremely uncommon; whilst the reverse, in all these respects, obtains in rheumatism.

Treatment.—Although of a strongly marked phlogistic character, rheumatism is not so much under the control of direct depletion as most of the other phlegmasial affections. Blood-letting is undoubtedly a very important auxiliary in the treatment of this disease; but it is incapable, by itself, of subduing the local inflammation, however copiously practised. Indeed, the very profuse sanguineous evacuations so frequently resorted to in this complaint, so far from proving beneficial, lead often to very disastrous consequences; for experience has fully established the fact, that metastasis of the local affection to an internal organ is particularly favored by thus draining the system of its blood, and impairing the vital energies. "We have long been convinced," says Dr. Johnson, "from attentive observation, that the system of detracting large quantities of blood in cases of acute rheumatism, is productive of more frequent metastasis from the extremities to internal organs than a more moderate treatment. If we do quell the external inflammation, a retrocession to some weakened organ is too apt to take place. Of this we have seen several instances."† The records of medicine furnish us with many examples illustrative of the correctness of this observation. The case reported by Dr. Kempher is a striking instance of this kind. This was a strongly-marked case of inflammatory rheumatism; the fever was violent, and "the joints of her limbs, from the elbows and knees downwards, were affected with swelling, redness, and most acute pain." In five days, nearly eleven pints of blood were abstracted from the patient. Metastasis of the disease soon took place, first to the lungs, and then to the head. At last the rheumatic inflammation returned to the extremities and relieved the internal organs.‡ Dr. Armstrong also has related a case of this kind.§ The inordinate use of the lancet, by debilitating the constitution, is, moreover, apt to prolong the disease in a subacute or chronic state, and to strengthen the predisposition to a recurrence of the affection. "In no way," says Scudamore, "is a degeneracy into chronic

* Richter says, rheumatism is always produced by *external* exciting causes, such as cold, and, therefore, more immediately from a *materia perspirabilis retenta*. Whereas gout arises from internal causes, giving rise to a peculiar atony and weakness of the system.

† Medico Chirurg. Review, June 1823, p. 215.

‡ Philadelphia Journ. Med. and Phys. Sciences, No. 12.

§ Lond. Med. and Phys. Journ., No. 289.

symptoms so certainly induced, as by that injudicious employment of general bleeding which enfeebles the constitution, and still leaves the rheumatic disposition in great force. Nor does the articular disease itself yield to the use of general bleeding in the manner which we might expect."*

Blood-letting, is, however, not to be entirely neglected in this affection. It is only against the too common abuse of this evacuation, that these observations are directed. In strong, muscular, and plethoric subjects, general bleeding, until some impression is made on the pulse, is a useful preliminary to the employment of the more efficient remedies in this affection. In general, one or two pretty copious evacuations in the commencement of the disease, will be sufficient to procure all the advantages this measure can afford. The attempt to render the pulse soft and moderate in its action by blood-letting in this disease, will almost always fail, unless blood be drawn to a very dangerous extent. The usual indication furnished by the buffy coat of the blood, for further depletion in inflammatory affections, is wholly fallacious in rheumatism; for the buffy coat will generally continue in despite of the most copious and repeated abstractions of blood. "A surer practical indication may be taken from the form of the coagulum and its firmness. When it is exceedingly cupped, and when the inferior part beneath the stratum of fibrine is very firm, it is a presumptive evidence that the heart and arteries are laboring under that morbid contractility which distinguishes the inflammatory diathesis."†

When the disease fixes itself *early* on some internal organ—particularly the heart, diaphragm, or brain, it will be necessary to resort to prompt and decisive bleeding; but even in cases of this kind, it will be much better, after one or two copious abstractions of blood, to resort to the use of opium and calomel, than to a repetition of the bleeding.

Purgatives are always useful in this affection. I have often known the inflammatory condition of the system more effectually reduced by the operation of two or three saline purgatives, than could be effected by several copious abstractions of blood. The more drastic articles of this kind ought to be avoided. These are in some degree incompatible with that regular action of the cutaneous exhalents which seems to be indispensable to the removal of this affection. Laxatives, on the contrary, are of much service by removing the sources of intestinal irritation—equalizing the circulation, and moderating the febrile reaction, without causing injurious irritation by their direct impressions on the mucous membrane of the bowels. As a general rule, the saline purgatives are to be preferred. I have usually directed from six to eight grains of calomel at night, to be followed next morning by a small dose of Epsom or Glauber's salts. Scudamore speaks very favorably of an aperient draught composed of small doses of carbonate of magnesia, carbonate of potash, sulphate of magnesia, with tartarized antimony, acetum colchici, and lemon juice sufficient to neutralize the carbonate of potash, and a portion of water and syrup. Two ounces of Epsom salts, with a grain of tartar emetic, dissolved in eight ounces of water, and taken in doses of a tablespoonful every hour, are an excellent aperient in this complaint.

Emetics have been much recommended in the treatment of rheumatism, and my own experience has furnished me with some striking examples of their usefulness. Horn asserts that he has derived more prompt advantage from emetics in this complaint than from any other remedy.‡ I attended a gentleman a few years ago who was suffering extremely from an attack of acute rheumatism. The principal pain and swelling were in all the joints of the left arm, and in the right knee. He had been freely bled and purged before I saw him, but the pains continued unabated. With a view to excite diaphoresis, and to

* A Treatise on the Nature and Cure of Rheumatism. London, 1827, p. 70.

† Scudamore, loc. citat., p. 70.

‡ Uber d. heils. wirk. d. brechmittel in hitzigen rheumat. Archiv., b. viii. s. 2.

moderate the febrile reaction, I prescribed a solution of tart. antim. Contrary to my intentions, the first dose produced pretty free vomiting. Almost immediately his pains were greatly mitigated, and continued so for three or four hours, and then gradually returned, though not to their former state of violence. On the following morning, I gave him an antimonial emetic, which produced full emesis, and again the rheumatic pains subsided, almost entirely for a few hours; they returned, however, as before, but so greatly diminished that he was enabled to obtain considerable sleep during the following afternoon and night. On the third day he took another emetic, after which the disease disappeared rapidly and completely under the use of a few full doses of opium. I have, since that time, derived signal advantage from emetics in several cases of this affection.

When rheumatism is complicated with functional disorder of the *liver*, emetics are particularly useful. In instances of this kind, the local pain will often almost entirely disappear for a time; and if full doses of calomel and opium are administered soon after the vomiting has ceased, convalescence will sometimes speedily ensue.

Diaphoretics may be employed with advantage, although little or no benefit is usually derived from *profuse* sweating excited by remedies of this kind. A gentle and uniform diaphoresis is always serviceable. For this purpose, small doses of *tart. antim.* in union with calomel and opium,* or with camphor and nitrate of potash;† or Dover's powder with calomel, may be advantageously employed. Scudamore recommends the following diaphoretic and anodyne mixture as particularly beneficial in this respect:

℞.—Potassæ carbonat. grs. cviii.
Succi citric. (recentis) ℥ii.
Misturæ camph. ℥iiss.
Liquoris opii sedativ. ℥iss. ad ℥ii.
Syrupi tolutan. ℥ss.
Antim. tartarisat. gr. i ad grs. ii.—M. Of this mixture, one, two, or three tablespoonfuls are to be taken every hour or two, until the pain is relieved.

The diaphoretic tendency of these remedies should be promoted by the use of warm diluents; such as weak infusion of eupatorium perfoliatum, of elder blossoms, &c.

Opium, under judicious management, is a valuable remedy in acute rheumatism. When employed in *full* doses, after proper venesection and purging, in combination with calomel, or with ipecacuanha, or tart. antim.,‡ it seldom fails to procure speedy relief, and to hasten the resolution of the local and general inflammatory action. When, after copious depletion, or from constitutional feebleness, the rheumatic inflammation passes upon some internal organ, opium is almost the only remedy upon which any reasonable hope of advantage can be

* ℞.—Tart. antimon. gr. i.
Pulv. gum. opii grs. iii.
Calomel grs. iv.
Pulv. sacch. albi grs. xii.—M. Divide into eight equal parts. S. Take one every two hours.

† ℞.—Tart. antimon. gr. i.
P. g. camph. grs. viii.
Calomel grs. iv.—M. Divide into eight equal parts. S. Take one every two or three hours.

‡ Tartarized antimony and opium have been employed with signal efficacy in rheumatism. Dr. Findlay, of Circleville, Ohio, has published an account of several severe cases of this disease which yielded very promptly to a combination of these remedies. He gave about one grain of the antimony with two-thirds of a grain of opium every hour. (*a*) I have myself lately employed this remedy in several cases, and with very speedy and entire success. Not more than four doses were required in an extremely severe case of lumbago, to put an entire stop to the pain. M. Lallemand speaks very favorably of grain doses of tart. antimony in rheumatic affections; and it is, in fact, a remedy of excellent powers in this respect.

(*a*) North American Med. and Surg. Journ., vol. x. p. 167.

placed. In my own practice, I have had many striking examples of the usefulness of this narcotic in the present affection. It should be given in full doses, and repeated every three or four hours, until relief from the pains is procured. Small doses of opium have a tendency to increase the phlogistic diathesis, whilst large ones, properly repeated, generally produce a contrary effect in acute symptomatic fevers. "It is worthy of consideration," says Scudamore, "that so powerfully does pain modify the influence of opium on the nervous system in every kind of disease, that it may be given in the boldest doses without hazard or ill effect, when pain is intense; and in *no way except by the active repetition* of such doses can it be really efficacious when the occasions for it are urgent." Dr. Cazenave very justly observes, that the timidity with which this narcotic is usually administered in acute rheumatism, is the cause of its frequent failure in doing conspicuous good. His mode of using opium in this affection, is to give a grain of it every hour, "till a complete calm is established, or an abundant perspiration induced."

Most practitioners who are in the habit of employing opium in rheumatism, use it in combination with calomel; and this has appeared to me the best mode of using it. After venesection, and the free operation of a cathartic, I generally resort at once to opium and calomel, in the proportion of one grain of the former to two of the latter every three or four hours, until the gums are slightly affected; after which I continue with half a grain of the opium, at first every three hours, and gradually prolonging the intervals in proportion as the disease subsides. I have frequently found, that as soon as the mercurial action was established, the skin became moist and relaxed, the pulse soft and less frequent, the urine sedimentous, with a rapid declension of the local and general affections. Dr. Armstrong observes, that after prompt venesection followed up by purgatives with calomel and opium, recovery is often surprisingly rapid. Many highly respectable authorities might be cited in favor of the united employment of these two articles in rheumatism.* "This treatment of acute, and we may say chronic rheumatism," observes Dr. Johnson, "is employed by many practitioners, and it is that which we have had recourse to for twenty years past."† It is not necessary to continue the calomel to the extent of producing free ptyalism. The slightest evidence of the mercurial action in the gums is, in general, sufficient.

The cinchona was formerly much recommended in the treatment of this affection. When, after depletion and purging, distinct remissions of the febrile symptoms occur, particularly in weak and relaxed habits, the powdered bark or quinine may be employed with advantage. But in robust, muscular, and sanguineous habits, it is much more apt to do harm, under any mode of management, than benefit. I have known very manifest injury done by the bark in this affection. During convalescence it is a proper and useful remedy.

Colchicum was at first prescribed only in the subacute or chronic forms of rheumatism; but later experience has shown that it may be employed with equal benefit in the acute form of the disease. Mr. Hayden, in his work on the remedial powers of this root, asserts, that it possesses very considerable powers in controlling the action of the heart, and subduing inflammatory excitement. I have exhibited this article in seven or eight cases of acute rheumatism. In one instance it removed the disease completely in the course of three days, although

* Dr. Chambers, of St George's Hospital, London, gives ten grains of calomel, with two of opium, every night, or night and morning, with a daily dose of black draught to evacuate the bowels. He states, that as soon as the mouth becomes affected, the symptoms usually subside. He does not push the medicine to the extent of producing ptyalism.—*Med.-Chir. Rev.*, vol. v. p. 566.

Mr. Gosse, of Geneva, has employed calomel and opium to ptyalism with success, in acute rheumatism. From some chemical experiments which he made with the blood of persons under salivation, he found that it contained much less albumen, as well as cruor, and was more liquid than usual; and that it is therefore less inflammatory. Similar opinions have been expressed by Dr. Farr and Mr. Travers.—*Med.-Chir. Rev.*, vol. i. p. 482.

† Med.-Chir. Rev., October 1826, p. 566.

previously very violent, and after calomel and opium, tart. antimon., venesection, and free purgation had been ineffectually used. In a few instances, it appeared to do some good, but in others no advantage whatever resulted from its use. Recently, however, I prescribed it in two instances of a subacute character with the happiest effect. Both patients were relieved by it in forty-eight hours, although the disease had for several weeks resisted other modes of treatment. Scudamore recommends the following formula for administering this remedy, where the inflammatory diathesis is not strong:

℞.—Liquor. ammon. acetat. ℥ss.
Vini colchici gtt. xx. ad xxx.
Syrupi papaveris ℥i.
Misturæ camph. ℥i.—M. This draught to be taken every sixth or eighth hour.

The vinous tincture of the colchicum seed may be given to the extent of from twenty to thirty drops, with about a scruple of calcined magnesia every four hours, until slight nausea or purging is produced.

When acute rheumatism continues until it assumes a subacute character—the pulse remaining irritated, small, sharp, and frequent, and the countenance pale, while the affected joints are swollen, painful and œdematous—great benefit may sometimes be derived from the extract of stramonium, given in quarter grain doses every four hours until vertigo ensues. I have succeeded in removing the disease, in a short time, in several instances of this kind, by means of the stramonium, after various other modes of treatment had been employed without avail.

Very little advantage is in general to be obtained from *local treatment* during the active period of the disease. After the general inflammatory excitement has in a great degree subsided, benefit may be derived from leeching the affected parts. I have also known much good done by blistering the inflamed joints under such circumstances.

The treatment by *compression*, so strongly recommended by Balfour, has not met with much approbation; less, I think, than it deserves. I have in a few cases of subacute rheumatic inflammation, known very considerable relief obtained from a flannel roller applied pretty firmly round the affected joint.*

The diet should, of course, consist of the mildest liquid farinaceous articles of food. The drink may be cool and acidulated except when diaphoretics are administered, when tepid diluents should be used. The temperature of the sick chamber should be kept comfortable and uniform.

Sect. II.—*Chronic Rheumatism.*

The symptoms of chronic rheumatism are much less uniform and definite than those which characterize the acute form of the disease. Chronic is often the consequence of acute rheumatism; but it occurs also, frequently, as a direct consequence of exposure to cold and damp air, more especially when the system is under the influence of mercury. The affected parts are commonly neither swollen nor red; nor is there often any manifest fever connected with the chronic variety of the disease; although quickness, tension, and contraction of the pulse are in some instances present in the evening, and during the night. The pain often wanders from one part to another, fixing itself by turns in the head, shoulders, knees, wrists, fingers, hips, loins, &c.—more especially in those cases which approach the subacute character. Some individuals are hardly ever entirely free from pain; others are affected with it only occasionally, on the occurrence of damp and cold weather. In some instances, the pain is seated in the joints; in others, in the muscles and parts situated between the joints. After remaining at

* Observations on the Pathology and Cure of Rheumatism. By William Balfour, M.D.—*Edinburgh Med. and Surg. Journal*, April 1825.

rest for a while, the patient feels stiffness and pain on attempting to move the affected limb; but on using exercise until the body becomes warm, both the pain and stiffness are apt to disappear. Those who are subject to this form of the disease generally feel a dull aching pain in one or more joints, on the approach of stormy or rainy weather. Severe and inveterate cases of chronic rheumatism are apt to give rise to organic disease of the tendons, bursæ mucosæ, with wasting and hardening of the muscular structure about the affected parts. The ligaments, also, sometimes become rigid, thickened, and the joints stiff. A jelly-like effusion into the cavity of the affected joints occurs occasionally. (Scudamore).

When the disease affects the muscles of the loins, it is called lumbago. Lumbago is distinguished from nephritis by the absence of pain along the ureters, or retraction of the testicles, of the frequent desire to void urine, and of the nausea and vomiting which characterize the renal disease. In lumbago, too, great difficulty and pain are experienced in bending the body forwards on the hips. In nephritis no uneasiness is caused by this movement. When the periosteum of the anterior aspect of the tibiæ, or of the ulna, or os frontis, becomes thickened and tender to the touch, we may presume that the chronic rheumatic affection is syphilitic or mercurial.

Chronic rheumatism sometimes occurs as the sequel of the acute form of the disease; and it arises frequently, also, as a direct consequence of suppressed perspiration from cold, damp, and variable weather. It is generally supposed that the action of mercury is particularly apt to give rise to chronic rheumatic pains; but it is extremely doubtful whether it possesses any direct tendency in this way. That the system, when under the mercurial influence, is extremely susceptible of the injurious effects of cold and humid air, is, indeed, sufficiently ascertained; and it is probable that when rheumatism follows the constitutional operation of mercury, it is always the immediate consequence of subsequent influence of cold. Syphilis is apt to give rise to distressing chronic pains of a rheumatic character, but even where syphilis appears to be its cause, it is probably often the consequence of improper exposure while the system is under the mercurial influence.

Mr. Teal has recently published a small work on subinflammation and irritation of the spinal marrow, in which he asserts that not only neuralgic but rheumatic affections frequently depend on irritation, or a slight degree of inflammation at the origin of the spinal nerves. His observations on this subject appear to me highly important, and from an instance which has quite lately come under my notice, I am satisfied that in some cases at least, chronic pains of a rheumatic character depend on spinal irritation. Dr. J. K. Mitchell, of this city, has within a short time published an interesting paper on this subject, in which he has detailed several striking instances of the speedy removal of severe pains of this kind, by cupping over the spinal region. It would appear from the observations of Teal and Mitchell, that in many cases of fixed pains, simulating rheumatism, one or more of the vertebræ of the spine are very tender to pressure, and that, if in such cases leeches or cups be applied over the diseased portion of the spinal marrow, almost immediate removal of the rheumatic pains will be effected. In the case which occurred in my own practice, the patient had complained of constant severe pain in the left foot for several months, and the usual means for the cure of such affection procured only slight temporary benefit. Instructed by the cases reported by Dr. Mitchell, I at last examined the track of the spine, and found two of the lower lumbar vertebræ morbidly sensible to pressure. I directed thirty leeches to the part, which afforded great relief, and in a few days afterwards more blood was drawn from the same spot by cupping, and this had the effect of entirely removing the disease in the foot. When the pains are situated in the head and upper extremities, the spinal affection, if any exist, will be found in the cervical vertebræ; and when a part about the chest, and upper portion of the abdomen, is the seat of the painful affection, there will probably be spinal irritation in one or more of the dorsal vertebræ. Under the head of neuralgia, I shall

again have occasion to speak of this subject; and, in fact, the painful affections which result from this cause, are probably always strictly of a neuralgic character, although often mistaken for chronic rheumatic inflammation. I must again repeat, that the facts developed by Mr. Teal are highly interesting, and will, no doubt, receive due attention from the profession.

Treatment.—Unless the patient be robust, vigorous and plethoric, general blood-letting is not only useless, but often injurious, in the strictly chronic form of the disease. Attention should be paid to the state of the digestive functions, and to the bowels. Where the appetite is weak and variable, and the bowels inactive, five or six grains of blue mass should occasionally be taken at night, followed in the morning with some gentle aperient—such as the aromatic tincture of rhubarb; or a small dose of the compound infusion of senna. Where there is a general sluggishness or languor of the system, the cinchona bark or quinine will sometimes prove decidedly beneficial. Certain diaphoretics of the stimulating kind have been much employed in the treatment of this variety of rheumatism; and of these *gum guaiacum* has held by far the highest rank. In individuals of a relaxed and phlegmatic habit of body, and in old persons of a worn-out constitution, it may be used occasionally with much advantage; but in persons of a contrary habit—plethoric, athletic, and phlogistic—it will seldom do good, and is even apt to do harm by its heating and irritating qualities. The usual mode of giving it in the form of a tincture, renders it still more objectionable in habits of this kind. In all instances, perhaps, it is best to give it in the form of an aqueous mixture, thus:

℞.—Pulv. g. guaiaci. ℥i.
—— g. Arabic ℥iii.—Triturate them together in a mortar, and add gradually ten ounces of cinnamon water. Of this, three or four tablespoonfuls may be taken daily.

In cases partaking of a subacute character, or in such as result from the influence of cold while the system is under the operation of mercury, *tart. antimon.* will occasionally prove beneficial. In instances of this kind, I have used this article dissolved in a decoction of the root of burdock, (*arctium lappa,*) with excellent effects. A grain of the tart. antim. should be dissolved in a pint of the decoction (an ounce of the root to a pint of water) and drank in the course of the day. In such cases, however, more advantage may in general be derived from the judicious employment of *mercury.* In syphilitic and mercurial rheumatism, the production of a gentle mercurial impression on the system, with the concomitant employment of the compound decoction of sarsaparilla, will often effectually eradicate the disease. But even in cases which are not connected either with a syphilitic taint or with mercurial disease, this remedy will sometimes prove decidedly beneficial. In inveterate and obstinate cases of chronic rheumatism, says Scudamore, "a well-conducted mercurial course, so as to produce and keep up a very moderate ptyalism, will sometimes prove successful after the failure of all other means." Advantage may be obtained from the use of the vapor-bath as an auxiliary to the mercurial course. I have used the following decoction, conjointly with mercury, with peculiar advantage:

℞.—Rad. sarsaparil. ℥iii.
Fol. chimaphila umbellat. ℥iss.
Rad. mezereon ʒiii.
Cort. ulmi fulv ℥iss.
Aqu. fervent. ℔iii.—To be boiled down to three half pints; of which a wineglassful is to be taken four times daily.

In the same variety of chronic rheumatic pains I have also administered the *sulphate of zinc*, in one grain doses three times daily, with the happiest effects. In one instance, after mercury, sarsaparilla, and a variety of other remedies had been fully tried without success, the zinc gave complete relief.

The extract of *stramonium* is highly recommended as a remedy in this affection by Dr. Marcet; and it is unquestionably an article of very valuable powers,

in chronic painful affections, unconnected with a phlogistic state of the system. Twenty years ago I employed the tincture of the stramonium seed in chronic rheumatism; and I have frequently found it promptly and completely successful, although often also entirely disappointed in its use. In some parts of the United States it has long been used as a domestic remedy in this affection; and it was from having seen it successfully employed by an old female in a case which had foiled all my efforts, that I first learned its remedial powers in this disease. I usually give twenty drops of the saturated tincture of the seed three times daily; and direct it to be continued until vertigo, or symptoms of gastric disturbance ensue. I have also employed the extract of stramonium in union with lactucarium, as is recommended by Scudamore, with excellent effect. "In some recent attacks," says this writer, "in which wandering nervous pains have been mixed with lumbago, the effects of this combination have been surprisingly successful. In a few cases, even of long standing, I have derived much satisfaction from this remedy."

Colchicum is a remedy of considerable powers in chronic rheumatic affections. I have found it most useful, however, in subacute cases, and in such as are the consequence of the acute form of the disease. In instances of a strictly chronic character, I have never derived any obvious advantage from this article; in such cases it is, I think, inferior in efficacy to the stramonium.*

In mercurial and syphilitic pains, *arsenic* will often manifest very excellent powers. It may even be given with occasional advantage in old and obstinate cases arising from other causes—and it is said to be particularly beneficial in such as depend on the repulsion of some chronic cutaneous affection. In several instances of a mercurial origin, I have prescribed Fowler's solution with complete success.

After what has already been said above, I need scarcely dwell on the propriety of examining the spinal column, in chronic pains of a rheumatic character. When any portion of it is found unusually tender to pressure, leeches, cups, or a blister, should immediately be applied over the tender part. If the disease be the consequence of spinal irritation, it will frequently speedily disappear under the use of these local remedies.

A great variety of other internal remedies have been recommended for the cure of this form of rheumatism. Of these, *savin*, *nux vomica*, *phytolacca decandra*, *dulcamara*, hyoscyamus, sulphur, turpentine, and *xanthoxylum fraxineum* are the most important. The savin is an old remedy in chronic articular pains;† I knew an empiric about twenty years ago, who was noted for his success in curing chronic rheumatism. His remedy was an electuary composed of savin, sulphur, and honey. I have prescribed it in a few instances with benefit; but in several cases its effects were manifestly injurious.

In chronic rheumatic pains of the hips (*sciatica*) and muscles of the loins (*lumbago*) the *spirits of turpentine* is among our most efficacious remedies. Home states that he cured five out of seven cases of sciatica with this article.‡ Within the present year I succeeded completely in removing a violent and protracted case of this affection by the turpentine, given in doses of twenty drops with a scruple of *lac sulphuris* three times daily. I have known the infusion of *capsicum* employed with marked advantage in a case of inveterate chronic rheumatism; and the juice of the *poke-berries* (phytolacca) is a familiar remedy in this affection, and has occasionally done considerable good. While practising in Lancaster county, I saw several instances of the successful use of a decoc-

* [Laterigue's pills, the composition of an eminent apothecary of Bordeaux, have become quite a popular remedy here in chronic rheumatism and gout. They are composed of:
℞.—Ext. colocynth. comb. grs. iss.
— colchici grs. iss.
— digitalis grs. iss.—M. One of these is given every sixth hour.—Mc.]

† Rave, Beobachtungen, &c.—Munster, 1796.

‡ Clinical Observations and Experiments.

tion of *xanthoxylum* in chronic rheumatism. Professor Wendt has found an infusion of the *clematis recta* and *vitaba* a very useful remedy in this disease.

Various external applications have been resorted to with advantage in this affection. The application of the *tourniquet*, so as to cause a temporary interruption in the circulation of the affected part, is said to have done much good.* Lately, the *vapor* of *camphor* has been used with success in chronic rheumatism by M. Delormel and M. Dupasquier.† The whole surface of the body, with the exception of the head, is to be exposed to the fumes of camphor, in an apparatus similar to the one used for the sulphurous vapor-bath. The camphor is evaporated by throwing it upon a dish of hot coals.

Acupuncturation has, of late years, been practiced by many physicians in local rheumatic pains unconnected with fever; and the numerous accounts that have been published respecting its effects are sufficiently favorable to entitle it to considerable attention. Mr. Berlioz observes, that "vague and wandering rheumatism sometimes attacks the external muscles subservient to respiration; the patient is obliged to remain motionless; every motion of the trunk compels him to cry out; deep inspiration is very difficult, and cough occasions such intense pains that expectoration is impossible. Acupuncturation dissipates instantly this state of distress, and renders the muscles their full liberty of action. In the space of one or two minutes, a patient whose sufferings drew from him tears, becomes entirely relieved." This operation has been found particularly efficacious in *lumbago*, and instances of its successful employment in *sciatica* have been reported. Acupuncturation should, however, never be practiced in cases attended with general febrile irritation, or in inflammations approaching the acute character.

Electro-puncturation—that is, inserting two needles, and connecting them with the opposite poles of a weak galvanic pile—has succeeded in cases after ordinary acupuncturation, repeatedly performed, had entirely failed. Dr. Graffe has reported a very severe case of rheumatism, of several years' standing, which, after having resisted every remedy and mode of treatment that could be suggested, yielded at last to the influence of electro-puncturation.—(*Graffe and Walther's Journal.*)

Rubefacients are always useful in cases of a strictly local character. Camphor dissolved in ether, as recommended by Ferriar, is an excellent application for this purpose. I have generally preferred using the following liniment:

℞.—Spir. camphor.
Aquæ ammon. āā ℥iss.
Ol. olivar. ℥i.
Spir. vini rect ℥iv.—M.

The warm bath, in conjunction with mercurial or diaphoretic remedies, has been useful in this affection. Baths and *douches* of artificial sulphurous waters have been particularly recommended. In local rheumatic affections, advantage may sometimes be obtained from blistering or cupping the affected part; but the benefits derived from means of this kind are seldom more than temporary. Sweating, induced by muscular action, particularly by walking with an additional quantity of clothing, rarely fails to give temporary relief, and has been known to remove the disease altogether by frequent and regular repetition of the exercise.‡

* Richter's Specielle Thérapie, b. ii. s. 61.—Abhandl. fur Pract. Arzte, b. xx. p. 509.—See also Duncan's Annals for 1801.

† Rev. Médicale, Mai 1829, p. 298.

‡ Marcet, Lond. Medico Chirurg. Transactions, 1812.

Sect. III.—*Gout.*

Gout is a constitutional affection, depending on a peculiar diathesis, and manifesting itself in its regular form by external local inflammation of the fibrous structures, and fever of the synochal grade. In relation to its symptoms and progress, however, it is subject to certain prominent modifications, which have given rise to its division into the three following varieties: *acute*, *chronic*, and *retrocedent* gout.

1. *Regular gout.*—The acute or regular form of the disease occurs in *paroxysms* at longer or shorter intervals, leaving the patient in an apparently perfectly healthy condition during the intermediate periods. Occasionally the paroxysm comes on suddenly, without any warning of its approach; but, in by far the greater number of instances, it is preceded by various premonitory symptoms: such as disturbed digestive function; a peculiar, uneasy, anxious, and empty feeling in the pit of the stomach; a sense of tension and weight in the abdomen; an irritable state of the bladder, flatulency and acid eructations, costiveness, a white tongue, giddiness, great lassitude, yawning and stretching of the legs, drowsiness, with disturbed sleep, depressed spirits, and debility. In some instances a disagreeable itching of the skin occurs a few days previous to the attack; and in most cases the urine acquires a deep red color. Some persons experience a feeling of numbness and formication in the lower extremities, with coldness of the feet and legs, before the paroxysm comes on. Sometimes the appetite is depraved and voracious, attended with occasional nausea and vomiting. Not unfrequently *blennorrhœal* discharges occur from the bowels or bladder, or a copious secretion of mucus takes place in the bronchia. Some patients experience a sensation as if warm, or more commonly cool air were passing in a gentle stream up and down the extremity, which is about to become the seat of the disease. According to Van Swieten, the venereal propensity is sometimes particularly urgent just before the accession of the attack.* Of all these symptoms, the dyspeptic, or those indicative of gastric disturbance, are the most common precursors of the gouty attack. The duration of this premonitory period is very indefinite, and varies from a few hours to many days.

The attack generally comes on at night. About two or three o'clock in the morning, the patient is roused from sleep by a severe pain in the ball of the great toe, or in the heel, or instep of one foot. Chills or rigors speedily ensue, terminating, after a short period, in febrile reaction. The pain now becomes more and more severe; the patient is restless; his skin hot and dry, and the pulse frequent, full, and generally hard. About five o'clock in the morning, some remission in the general and local symptoms usually occur, with more or less profuse perspiration, and a short interval of imperfect rest is obtained. In some instances, the pain and fever continue, with unabated violence, until about the middle of the following night, when they gradually decline, under a moderate flow of sweat—the patient sinking into a quiet sleep towards morning. In very severe attacks, however, no obvious remission of the symptoms take place, until the third or fourth morning. In all instances, however, the sufferings of the patient are greater during the fore part of the night than in the day. When the affected part is examined in the morning after the accession of the paroxysm, it is found swollen, red, and the veins at the foot greatly distended with blood. The swelling is of an œdematous character, more especially after the disease has continued a few days. The tenderness of the inflamed joint is so great, that the weight of the lightest bed-clothes is often insufferable, and every motion or agitation of the limb excites the most torturing pains. In slight attacks, the constitutional symptoms are moderate; but in the severer cases, the febrile excitement

* Comment, vol. xiii. p. 44.

is always very considerable. The digestive functions are almost invariably conspicuously deranged; the tongue is furred, the appetite wholly depressed, the thirst urgent, the bowels constipated, with colic pains, and a sense of uneasy weight in the epigastrium. An unusual degree of nervous irritability prevails during the paroxysm, the patient being generally fretful, irritable, and difficult to please.

The duration of a first paroxysm of the disease is seldom less than five, or more than nine days; but in subsequent attacks, it is often protracted beyond the second, or to the end of the third week. After the disease has subsided in one foot, it occasionally attacks the other, and passes regularly through its course, as in the first instance.

The patient is usually left in a much better state of health, after the complete subsidence of the paroxysm, than he enjoyed previously to the occurrence of the attack. His mind and body are, as it were, renovated; his appetite and digestion are good, and his powers, both mental and corporeal, more lively and energetic. Sooner or later, however, according to the degree of constitutional predisposition, and the habit of living, the paroxysm is renewed. At first, the return of the disease is generally at long intervals; in some cases, only after a period of three or four years; though more commonly its first visits are annual. The intervals of its recurrence gradually become shorter, in proportion as the constitutional energies are enfeebled by its attacks, until at last, "the patient is hardly ever tolerably free from it, except, perhaps, for two or three months in the summer." (Cullen.) The periodicity of gout is occasionally very regular. Scudamore mentions an instance where the attack returned regularly on the 12th of April, for three years in succession. Such a strict periodical recurrence of the disease is, nevertheless, very rare.

At first, the inflammation occurs generally only in the feet, but when, by the frequent recurrence of the attacks, the system is weakened, and the gouty diathesis strengthened, several joints sometimes become simultaneously affected, or the inflammation passes successively from one external part to another, in the same paroxysm. (Scudamore.) "The external appearances of the disease," says Scudamore, "vary considerably, according to the situation and particular texture of the part which is affected. The redness of surface, together with the œdematous swellings, is most remarkable on the great toe, on the foot, the back of the hand, and at the elbow; while at the ankle, knee, and wrist, the increased bulk is produced chiefly by the distension of the bursæ, and the sheaths of the tendons, and takes place often with little change in the natural color of the skin."

The *sequelæ* of gout are various, and sometimes of a very distressing character. The liver always suffers more or less functional disorder, and in some instances, undergoes structural derangement. The stomach seldom escapes becoming permanently debilitated from repeated attacks of the disease. The local effects of repeated attacks of gout are sometimes less distressing than the general affections which result from it. The tendons about the affected parts become hard and knotty, and in some instances complete anchylosis ensues.

Chronic gout.—When, from the repeated attacks of the acute form of the disease, the system becomes enfeebled, or where there is an original deficiency of constitutional energy connected with the gouty diathesis, the disease does not manifest itself by paroxysms of *acute* inflammation, but by chronic wandering, and irregular pains, bearing much resemblance to chronic rheumatism.

The pain in chronic gout is usually but moderate during the day, the patient experiencing only a sense of alternate heat and coldness in the affected parts; at night, however, it is generally severe and aching. A feeling of numbness and weight is experienced in the diseased parts, and slight cramps are apt to occur during the forepart of the night, and the sleep is restless, and interrupted by sudden startings. The affected joints retain their natural color, or present only a slight purplish hue; but they become œdematous, tender, and more or less stiff; and the neighboring muscles are weakened, and sometimes diminished in

size. The inflammation often passes successively from one joint to another, or it leaves the original seat, and fixes upon some distant joint, and after having remained there for a while, returns to the part it had left.

There is rarely any very conspicuous fever: but the digestive and biliary organs are generally very prominently deranged. The dyspepsia attending this form of the disease, says Scudamore, is particularly characterized by great oppression, and flatulent distension of the stomach after a full meal, together with heartburn, and occasionally a sense of coldness in the stomach. The bowels are usually torpid, or affected with mucous diarrhœa; the urine is turbid, and often charged with mucus; the skin dry, contracted, and sallow; the bilious secretion deficient; and both the animal and vital functions much impaired. The temper, in this variety of the disease, is always very irritable, dissatisfied, morose, irresolute, and sometimes gloomy or hypochondriacal. In some instances, pain is occasionally felt in the kidneys, or neck of the bladder, and gravelly matter is discharged with the urine.

The local consequences of inveterate or chronic gout are often extremely distressing. The ligaments become thickened; the bursæ mucosæ indurated and enlarged; and the tendons knotty, rigid, and contracted. In some individuals, strongly predisposed to the disease, earthy matter is deposited in the bursæ, sheaths of the tendons, under the cuticle, and in the cellular membrane surrounding the affected joint. Mr. Brodie observes: "The effects of gout on the joints are very remarkable. The cartilages are absorbed; the exposed surfaces of bone are entirely, or partially encrusted with white earthy matter, which I conclude to be urate of soda; and sometimes they have the appearance of being formed into grooves, as if they had been worn from their friction on each other."

Retrocedent gout.—When the gouty inflammation, either of the acute or chronic form, leaves its external seat, and fixes on some internal organ, it constitutes what is termed retrocedent gout. This *retrocession* of the disease may depend either on a want of constitutional energy, or upon an accidental or habitual weakness of some internal organ; or finally, on cold, repelling, and debilitating applications made to the external gouty inflammation. The disease may be translated to almost every internal organ; but the parts most commonly affected, are the stomach, bowels, brain, heart, and kidneys. When an acute attack of gout passes to the brain, coma, furious delirium, or symptoms of apoplexy, speedily ensue. Paulmier relates a case where the retrocession of gouty inflammation from the foot to the brain gave rise to peculiar visual illusions; the patient being harassed by a confusion of horrid and ludicrous sights, which were removed in a few hours by epispastics applied to the feet.* When the stomach becomes its seat, violent and often fatal spasm of this organ, or symptoms of acute gastritis, supervene. In the intestines, retrocedent gout generally gives rise to enteritis, or violent colic. If the heart becomes its seat, symptoms of angina pectoris, or more commonly protracted and generally fatal syncope occurs. When the disease passes to the lungs, it gives rise to violent and most painful asthmatic symptoms; in the kidneys, it causes nephritis; and when it fixes on the neck of the bladder, the phenomena of vesical calculus ensue.

It has been a subject of considerable controversy whether the internal affection which arises from translated gout be of an inflammatory nature, or whether spasmodic. It is probable, I think, that the metastatic affection may assume either character, according to the structure upon which it falls, or the peculiar habit of the system. In the stomach, it appears sometimes under the form of violent and rapidly fatal spasm; and in the brain, coma and convulsions; although in both organs the ordinary symptoms of inflammation often occur when invaded by the disease.

In the *atonic* and obscure form of the disease, where the gouty affection is, as it were, floating about in the system, with an occasional imperfect manifestation

* Dict. des Scien. Med., t. xix. p. 112.

of its presence in the joints of the extremities, the effects of its attacks on internal parts are not so violent and dangerous as those resulting from metastasis of the acute form of the disease, although often extremely distressing. Indeed, atonic, or irregular chronic gout, often fixes upon internal organs at once, and without the previous or concurrent appearance of external articular inflammation. It sometimes locates itself in the mucous membrane of the urethra, giving rise to a blennorrhœal discharge, resembling gonorrhœa. In old and gouty habits, the mucous membrane of the bowels sometimes becomes affected with the gouty irritation, producing muco-purulent discharges from the rectum;* and a similar discharge is still more common from the kidneys and bladder in such individuals. Hemorrhages from the nose, lungs, kidneys, and womb, have been known to arise from gouty irritation; and Richter observes, that hemorrhoids are particularly apt to occur in gouty habits.†

Various cutaneous affections depend, sometimes, on a gouty condition of the system. Richter says, "there is a gouty *itch*, as well as *herpes*, which latter is apt to appear on the parts in which the gout is wont to appear, and particularly on the wrists and the ankles." Gilbert relates an instance in which a number of furuncles appeared, instead of a regular attack of the disease, in a person who had been long subject to hereditary gout.‡

Chronic gouty affection of the stomach may show itself by pyrosis; extreme sensibility of the stomach; bulimia; or total anorexia with gastralgia and flatulency. De Haen mentions a case, where the desire for food recurred at times so violently and suddenly, that if it was not immediately satisfied, severe pain in the stomach, with nausea and violent vomiting, speedily ensued. Stoll relates an instance of spasmodic dysphagia from gouty irritation. Chronic gout, located in the bowels, sometimes gives rise to a colicky affection, with paralysis of the lower extremities, strongly resembling *colica pictonum*. The genital organs are occasionally affected by chronic gout, giving rise to painful and protracted priapism, and pollutions. The uterus, too, often becomes the seat of gouty irritation, particularly about the period of the final cessation of the catamenia. "A state of chronic inflammation of the uterus ending in a kind of enlargement and induration of this organ, is occasionally the consequence of this affection." (Richter.) Chronic pectoral affections are extremely common in old people who have been much afflicted with gout. Cough, dyspnœa, asthma, with copious mucous expectoration, or occasional violent and distressing sanguineous engorgements of the lungs, (apoplexia pulmonum,) are the usual occurrences in cases of this kind. It would seem, too, that retrocedent gout is not unfrequently the cause of hypertrophy, ossification, and other organic affections of the heart. (Kreysig.) Pott mentions a case of hydrocele, which disappeared on the occurrence of a regular paroxysm of gout; and it is stated by Musgrave, that chronic gout sometimes assumes the character of scurvy. There is, indeed, scarcely any form of acute or chronic disease which may not arise from gouty irritation, and almost every organ or structure of the system may be the seat of its ravages.

Diagnosis.—The only affection with which gout is apt to be confounded is rheumatism; and there exists, indeed, a very close resemblance between them, although sufficiently diverse, in several essential circumstances, to justify their being regarded as distinct forms of disease. The principal points of difference between these two affections, have already been mentioned under the head of rheumatism, and need not, therefore, be repeated in this place.

Causes.—Gout, unlike rheumatism, requires a peculiar constitutional habit or *predisposition*, before any exciting cause can develop the disease. This predisposition is frequently *hereditary*, and perhaps still more frequently *acquired* by certain habits of living. Where the predisposition is very strong, and this will generally be the case when it is derived from both parents, scarcely any pre-

* Reil's Fieberlehre, b. iii. p. 596.
† Specielle Thérap., tom. vi. p. 571.
‡ Dict. des Scien. Med., tom. xix. p. 117.

cautions in avoiding its usual exciting causes are sufficient entirely to obviate some manifestations of the disease. It is asserted by some writers, that, however considerable the gouty predisposition may be, the disease occurs but exceedingly seldom, and some assert never, before the age of puberty. Richter, however, affirms that the disease sometimes, though indeed very rarely, occurs even in childhood. This predisposition does not manifest itself in early life, by any obvious defect of constitutional vigor or health. The children of gouty parents are as apt to be strong, robust, and to possess apparently as vigorous digestive and assimilative powers, as those born from parents of the most healthy habits. Barthez, however, observes that the hereditary predisposition to this disease is generally attended with a peculiar physiognomical expression, by which an experienced eye may detect its existence.* The age at which gout usually first shows itself, is between the thirtieth and fortieth year. Women are much less subject to this disease than men; and in its regular and acute form, located in the feet, it is almost exclusively confined to the latter sex. When gout does occur in females, it is almost always after the period of the final cessation of the menses, and in them it usually assumes somewhat of an atonic or irregular character. Hippocrates observes, that eunuchs are never affected with gout; an observation which is, however, contradicted by Dreysig† and others.

The *causes* which are especially calculated to *produce* a predisposition to gout in habits free from hereditary diathesis favorable to this disease, are, the habitual and superabundant use of rich, nourishing, and strongly seasoned articles of food, particularly animal diet; and the free indulgence in vinous or fermented liquors, in conjunction with an indolent, inactive, and luxurious course of life.

Vinous liquors are much more apt to lay the foundation of gout than distilled *alcoholic spirits;* and of the former it would appear that *champagne*, *claret* and *port*, have a considerably stronger tendency in this way than *Madeira*, *Lisbon*, and *sherry*, "because in addition to their equal or greater heating effect, they give rise to more acidity in the primæ viæ." (Scudamore.) Dr. Rush, in reference to the comparative tendency of wine and ardent spirits to produce gout, observes that the effects of the latter are too sudden and violent to admit of their being thrown upon the extremities, and that they appear only in visceral obstructions, and a complicated train of chronic diseases. "The effects of wine," he says, "like tyranny in a well-formed government, are felt first in the extremities; while spirits, like a bold invader, seize at once upon the vitals of the constitution." Indolence, or an inactive course of life, contributes powerfully to the production of the gouty diathesis. Neither rich and high-seasoned food nor the free indulgence in vinous potations, is apt to produce the predisposition to gout where it is counteracted by a laborious or very active course of life.

The principal exciting causes of gout are, intemperance in eating and in the use of spirituous liquors; suppression of habitual evacuations; violent or depressing mental affections; cold and humidity; redundancy of acid or bile in the primæ viæ; fatigue both of body and mind; intense and protracted study; external injuries; the abuse of mercurial remedies; excessive evacuations, particularly sanguineous discharges; excessive venereal indulgence; and a sudden change from an abundant and nourishing to a spare and innutritious diet.

Proximate cause.—In relation to the *proximate* cause of gout, a very great variety of opinions have been expressed by pathologists. The hypothesis which has obtained most credit, in reference to the pathology of this disease, is that which ascribes it to a particular morbific matter in the blood. It has been supposed to depend on an excess of *uric acid* in the system; since, according to the observations of Wollaston, there always exists a redundancy of this acid in gouty persons. Berthollet thought that an excess of *phosphoric acid* constitutes the

* Barthez. Traité des Maladies Goutteuses. Paris, an. 10.

† Anfangsgr. der pract. Arzniew, p. 711, as quoted by Richter:—Specielle Thérapie, b. vi. p. 605.

proximate cause of the disease—an opinion to which he was led from having observed that the urine of gouty individuals was much less charged with this acid during the absence of the active state of the disease than in healthy persons; but that it became abundant on the approach and during the continuance of the gouty paroxysm. Some have contended, that instead of a superabundance of an animal acid in the system, the *materia arthritica* is of an alkaline character. It is asserted by Petit that the perspiration of a gouty patient has been known to turn the tincture of violets into a green color.* The theory of Herrisant, and, in general, the identity of the nature of urinary calculi, and of gouty concretions, though apparently confirmed by the experiments of Scheele, has been fully confuted by Wollaston—since, from his experiments, it appears that gouty concretions always contain *lithate of soda*, which, according to Fourcroy, never enters into the composition of urinary calculi.† Scudamore has entered into an elaborate experimental examination of the two former of these doctrines. In relation to Wollaston's hypothesis, he ascertained by experiment, that the appearance and quantity of *uric acid* are always connected with, and proportionate to the unhealthy state of the chylopoietic function, but neither necessarily nor regularly an attendant on gout. With regard to the opinion of Berthollet, his experiments show that, although an increased secretion of phosphoric acid in the urine occurs in the paroxysm of gout, yet the same takes place in other diseases; as, for example, in diseases of the liver, and in some forms of fever. It is evident, therefore, that the chemical products which occur in gout are various, and that they are to be regarded rather as the *effects* of a peculiar morbid condition of the organization, than as the proximate cause of the gouty phenomena—or as furnishing any evidence of a *specific* gouty matter in the system. (Richter.) Without, however, referring to any other doctrines on this head, it may be observed, that disorder and debility of the digestive functions are one of the most constant precursory, as well as concomitant occurrences of an attack of this disease. From the constant attendance of this gastric disorder, Broussais and some other writers have been led to regard the disease as primarily located in the primæ viæ, and as depending on a peculiar irritation in the mucous membrane of the alimentary canal. The dynamic doctrines of Stahl, Cullen, Barthez, Sprengle and others, are even less satisfactory than those which place the proximate cause of the disease in some morbid disposition of the blood. It can, nevertheless, scarcely be doubted, that some defect or derangement of the *reproductive functions* lies at the bottom of the evil; and that this primary dynamic disorder, in conjunction with the consequent *humoral* depravation, constitutes the fundamental pathological condition of the system in gout.

Treatment.—The treatment of gout divides itself into that which is proper during the paroxysm, and that which is appropriate during the intervals of the fits. To obviate or postpone the recurrence of the disease after it has once made an attack, an abstemious course of digestible diet must be enjoined, and the use of wine and other fermented liquors interdicted. Various remedies have been recommended during the premonitory stage, with the view of preventing the development of the approaching paroxysm, or of moderating its violence—all of which, however, are much more apt to prove injurious than beneficial, and ought to be rejected as hazardous.‡

During the attack of the disease, the general treatment must be more or less antiphlogistic, according to the degree of general phlogistic excitement present.

* Dict. des Sciences Méd., t xix. p. 162.

† Richter's Specielle Thérapie, b. vi. p. 634.

‡ The following means have been advised in the forming stage of the disease, in order to moderate or prevent the paroxysm. Emetics, (Chalmers;) active cathartics, (Musgrave;) vegetable bitters, iron, and high-seasoned food, (Grant;) Dover's powder or antimonial wine with opium, (Fothergill;) large doses of musk or castor, (Williams;) gratiola, (Wolff;) bleeding from the foot, (Gilbert;) the application of very cold water to the feet, (Giannini:) the internal use of iced-water, (Barthez;) &c.

Unless the system is very plethoric, and the habit vigorous and inflammatory, bleeding may be well dispensed with. Under no circumstances, indeed, can this evacuation be regarded in any other light than a doubtful auxiliary; and when carried to a great extent, may do serious injury by favoring metastasis to internal organs. It is true, instances are mentioned where the local affection was speedily removed, and by prompt copious abstractions of blood, without any immediate evil consequences; but the cases where this practice was productive of dangerous effects, are sufficiently numerous to demonstrate its dangerous tendency when very actively employed. I am well aware that there are eminent authorities on the side of decisive blood-letting in this affection. Heberden, Rush, and Hamilton, insist strongly on the propriety of venesection in gout; but the present sentiment of the profession is opposed to this measure as a *principal* remedy; although, moderately employed, it is generally admitted to be useful under symptoms of high vascular excitement.

Cathartics are decidedly beneficial in the attack of regular gout. The alimentary canal is always more or less loaded with dark-colored, vitiated, and irritating matters, which should be as speedily evacuated as possible. Scudamore recommends the following pills—a combination which I have used with very good effect.* He advises the exhibition of cathartics and diuretics conjointly, as particularly useful in the gouty paroxysm. "I have experienced the most remarkable success," he says, "from a draught composed of magnesia grs. xx; sulphat. magnesiæ ℥iss; vin. colch. ℥iss, with a little sweetened water. This draught should be repeated at intervals of four, six, or eight hours, according to the freedom of its operation and the urgency of the symptoms." The bowels should be kept freely moved throughout the paroxysm.†

Emetics also have been recommended in the treatment of gout; and where the symptoms of redundancy of acid, or bile, or other offending matters in the stomach, are unequivocal in the commencement of the disease, advantage may, no doubt, be obtained from the administration of an emetic. As a general rule, however, emetics are inappropriate in this affection. They are indicated when there is much nausea, vomiturition, acidity in the stomach, with a furred and foul tongue, or where the disease supervenes soon after a hearty meal. Ipecacuanha should be employed for this purpose in preference to antimony.

For the purpose of keeping up a gentle diaphoresis, we may employ opium in combination with calomel and tartar emetic with much advantage, after the bowels have been freely evacuated by purgatives. A grain of opium, with the same quantity of calomel and one-tenth of a grain of tart. antim., may be given every four or six hours—assisted by copious draughts of infusion of elder flowers, or of eupatorium perfoliatum. I have used the diaphoretic mixture, given at page 135 of this work, with the addition of a drachm of laudanum, with excellent effect.

To moderate extreme suffering from the gouty inflammation, and to procure the patient some repose, *opium*, under proper management, is both safe and a highly useful medicine.

"On many occasions," says Scudamore, "when the patient has described the pulsatory throbbing of the inflamed part to resemble almost the successive blows of a hammer, when the heart has been in inordinate action, and the inflammatory diathesis has appeared altogether urgent, I have stood by the bedside and witnessed the happy power of a free administration of opium, in causing an abatement of the action of the vessels, and producing universal tranquillity in a short time." I have myself employed opium in this affection with the happiest effect. Not only is the extreme pain allayed, but the sympathetic febrile excitement also

* ℞.—Extract. colocynth. compos. ℥ss.
Calomel grs. xv.
Tart. antimon. gr. i.—M. Divide into sixteen pills. S. Two or three to be taken on going to bed.

† Boerhaave, Warner, and some other writers, reject purgatives wholly from the list of remedies proper in this disease, but their apprehensions in this respect are without foundation.

is generally conspicuously moderated by full doses of this narcotic. The bowels should be freely evacuated before recourse is had to this medicine. It may be given in doses of one grain, either by itself or as mentioned above, with calomel and tart. antim., every hour or two until the local pain is allayed. When opium disagrees with the stomach, the *black drop*, or the *liquor opii sedativus* of Dr. Battley should be employed.*

A great number of *specifics* and *nostrums* have at different times acquired a temporary reputation for their usefulness in this disease; of which, however, a few only need be mentioned.

The *colchicum autumnale*, which would seem to be the hermodactyl of the ancients, is now universally admitted to be an article of great powers in removing gouty inflammation. It is not, however, admitted on all hands to be a very safe remedy; for it is asserted by some, "that it is apt to leave the predisposition to the disease much stronger in the system; to lead to the still more calamitous, because still more constant, pains of the chronic form of the disease." (Scudamore.) That the objections which have been urged against this article are altogether unfounded, I am not disposed to affirm; but I think it highly probable, that much of the harm which has been ascribed to it has arisen from the improper or inordinate use of the remedy. I have used it in about a dozen instances with marked advantage, and so far as I have ascertained, without any prejudicial consequences whatever. Even Scudamore, whose objection to this article I have just quoted, observes, that under judicious management, it may be employed with perfect safety, and almost always with decided benefit. He gives it with magnesia and Epsom salts, according to the formula above referred to in page 135. I have usually directed from thirty to fifty drops of the vinous tincture with about twenty grains of magnesia, to be taken every six hours until it acts on the bowels. When it produces nausea, or other unpleasant sensations in the stomach, its use must be discontinued.

The *eau medicinale* is a celebrated nostrum, which has been extensively used in France; and its powers of shortening the paroxysm are said to be surprisingly great. It is now generally admitted, however, that in its ultimate consequences, it often proves highly injurious. When first used, it rarely fails to remove the gouty inflammation speedily; but its powers in this way are gradually diminished by repetition—producing at last great derangement of the digestive functions, permanent nervous irritation, giddiness, trembling, coldness, and œdema of the extremities, and other manifestations of infirm health. The tincture of *white hellebore* and laudanum has also been found promptly efficient in removing gouty inflammation, but it is said to be as pernicious in its consequences, and even more so, than the *eau medicinale*.

Local remedies.—Various local applications have been employed in the treatment of gouty inflammation; but the majority of them are useless, and indeed often prejudicial. Neither leeching, nor blistering, nor warm pediluvium, appears to be calculated either to relieve the pain, or to promote the resolution of the local affection. Leeching even sometimes increases the pain. Some have advised the application of cold water to the inflamed joint—a measure which will, indeed, often moderate the pain and inflammation, but its particular tendency to cause a retrocession or translation of the disease to internal organs, renders it objectionable.† Scudamore observes, that the best local applications are such as are volatile and stimulating. He strongly recommends a liniment composed of one part of alcohol and three parts of *mistura camphorata*, which is to be applied to the affected part in a lukewarm state, by means of several folds of linen strips

* Opium is very favorably mentioned as a remedy in this disease, with the view of moderating the patient's sufferings, by Sydenham, Warner, and Richter.

† The practice of applying cold water to the inflamed joint in gout is recommended by Hippocrates—(*Aphor.*, sect. v.)—Kinglake employed cold poultices.—*Med. and Phys. Journal*, No. 24.

saturated with it. I have employed this lotion in several instances with decided benefit. Its good effects were manifested by a speedy mitigation of the heat and pain of the affected part. The application of ether will also afford relief by its rapid evaporation, and consequent subduction of the heat and local excitement of the inflamed joint.*

Wrapping the part in flannel was formerly regarded as the most safe and beneficial application; but "flannel and patience" have very properly grown out of fashion; for this application tends to protract the paroxysm, and to aggravate the sufferings of the patient, without affording any peculiar advantages as to the future health of the patient. Where there is slight or incomplete development of the gouty inflammation in the extremities, with a tendency to retrocession, benefit may, no doubt, be derived from the application of flannel or cotton to the part; but, in the regular and fully developed attack, it is at best useless, and often distressing.†

During convalescence after an attack of gout a temperate and moderately nourishing diet, with regular exercise and the occasional use of mild laxatives, should be enjoined. When the biliary and digestive functions remain disordered, which is very commonly the case after violent and protracted paroxysms, small doses of blue pill in the evening, with an occasional laxative and a weak infusion of colomba or gentian, in small but repeated doses during the day, should be used.‡ To remove the protracted swellings which sometimes remain, stimulating liniments may be usefully employed; or, as Scudamore recommends, a flannel roller applied to the affected part.

The remedies or prophylactic means that have been recommended during the intervals of the paroxysm, with a view of moderating the gouty diathesis, or of preventing the recurrence of the disease, are very numerous. Little or no dependence, however, is to be placed on any measures in this respect, except on such as are calculated to restore the healthy action of the stomach, liver, and skin; and especially on the adoption of proper regulations, with regard to diet and exercise. Abstinence from high-seasoned and very nourishing diet, and from all kinds of fermented liquors, with regular exercise in the open air, a constant attention to the maintenance of the healthy action of the bowels, liver and skin, by the occasional use of laxatives, blue pill, and weak infusion of some of the tonic vegetable bitters; and the wearing of flannel next to the skin, will, perhaps, do all towards resisting the progress of the disease that can be effected by remedial means. According to the experience of Scudamore, the ammoniated tincture of iron, commencing with 20 drops twice daily, and gradually increasing the dose to 60 drops, is an excellent tonic during the intervals of the gouty paroxysm.

In the treatment of the *chronic form* of the disease, the principal attention must be directed to the chylopoietic organs. A light and digestible diet, with an occasional blue pill in the evening, followed in the morning by a gentle laxative, are among the most useful remedial measures in this variety of the disease. To relieve the nervous irritation and pain, generally so distressing during the night, we may give one or two grains of opium, or from 15 to 20 drops of *black drop* at bedtime. Scudamore recommends lactucarium and stramonium in combination, as a very useful narcotic in such cases. Opium, in union with camphor, forms also an excellent anodyne in instances of this kind. The carbonate of ammonia, or from 20 to 30 drops of a solution of camphor in sulphuric ether, (℈iii of

* [I have often seen a strong solution of lunar caustic (40 grs. to the ℥i) applied over the inflamed parts by a swab, so as to blacken the cuticle, give immediate and effectual relief.—Mc.]

† A great variety of other local remedies have been favorably mentioned—namely, the warm steam bath, (Percy;) the split leaves of the *cactus crocus*, emplast. hyoscyam, spread on oiled silk, (Thilenius;) emplast. opii; cataplasms of conium, belladonna and hyoscyamus, and *moxa*.

‡ As an aperient during convalescence from gout, Warner's gout cordial is an excellent remedy. The formula for making this tincture is as follows: ℞—Rhubarb ℥i, senna ℥ss, saffron ʒ, liquorice root ʒiv, raisins ℔i, brandy ℔iii. Digest for a week, and strain.

camph. to ℥i of ether,) or warm ginger tea, may be usefully administered, to relieve the spasmodic and nervous pains in the stomach, which are so common in the chronic form of gout. A vast variety of remedies have been recommended for the removal or mitigation of chronic arthritic affections. Amongst these, however, there are very few that are worth being mentioned. Gum guaiacum; ol. terebinth.; calamus aromaticus, (Rave, C. L. Hoffman;) and particularly the vegetable bitter tonics; aconitum, (Richter;) the bark of the *prunus padus*, (Horn's Archiv., 1812;) chalybeates; herba rhododend. chrysanthi; belladonna; mercurial remedies; and the use of sulphurous mineral waters, are the principal articles of this kind. Rave, a German writer, speaks in very favorable terms of *savin* (*juniperus sabina*) in chronic gouty inflammation of the joints.* I have known much benefit derived from this article in chronic or subacute arthritic affections, more especially in subacute rheumatic inflammation. Rave recommends the following formula for taking the savin.† In an atonic, torpid, or sluggish state of the system, with chronic gouty symptoms, the following composition, recommended by Quarin, will sometimes act very beneficially.‡ Alkaline remedies have also been supposed peculiarly adapted to counteract the gouty diathesis, but they appear to be of little or no value in this respect. Formerly the *liquor anti-arthriticus Elleri* was much in vogue as a remedy in chronic gouty affections. It consists of equal parts of sulphuric ether and aq. ammon. succinata. The dose is from 30 to 40 drops.

When the gouty inflammation leaves its external seat, and fixes on some internal organ, prompt and active remedial measures are necessary to obviate the immediate danger. Cullen recommends heating and stimulating remedies in retrocedent gout; where the disease attacks the stomach, this, without doubt, is often the best practice. Laudanum in large doses, (from 80 to 100 drops), with warm spiced brandy, should be freely administered; and a large sinapism applied over the region of the stomach. Opium, in the form of tincture, is a most valuable medicine in cases of this kind. Even where the translated affection assumes the character of acute gastritis, and where the aromatic and diffusable stimulants are improper, the greatest relief will often follow the exhibition of large doses of this narcotic. When the *brain* becomes the seat of the translated disease, stimulants and opiates are inadmissible. In such cases, our principal reliance must be placed on the speedy and copious abstraction of blood, together with the use of active mercurial cathartics, cold applications to the head, and sinapisms to the feet. In all instances of translated gout, stimulating or rubefacient applications to the feet are decidedly indicated. Irritating purgative enemata also are useful, as well as cupping and leeching over the region of the affected organ.

* Beobachtungen und Schlüsse aus der praktischen Arzneywissenschaft. Von Alexander Rave. Munster, 1796.

† ℞.—Herb sabin. recens ℥ii.
Tinct. antimon. acris. ℥vi.—M. Digere per 3 vel 4 dies.
Or, ℞.—Pulv. hb. sabin. recens ℥ss.
Antim. crud. grs. xii.
Flor. sulph. grs. xv.
Camphor. grs. iv.—M. f. pulv. pro. dos. This dose is to be taken twice or thrice daily.

‡ ℞.—Flor. sulph. ℥i.
Resin. guaiac. ℥ss.
Antim. crude ℥iii.—M. f. pil. pondere grs. iii. S. Take from six to eight pills three times daily.

CHAPTER XVI.

ON THE INFLAMMATORY AFFECTIONS OF THE EYES.

1. *Catarrhal Ophthalmia.*

This is the most common form of ophthalmia in adults, and proceeds, as its name imports, from the influence of atmospheric vicissitudes, and especially from cold and damp night air. The inflammation in this variety of the disease is confined chiefly to the conjunctiva and the Meibomian glands. The patient complains of pain, intolerance of light, and a *constant sensation of sand in the eye*—which latter feeling may, according to Mr. Mackenzie, be regarded as a diagnostic symptom of this variety of ophthalmia.* In mild cases, the redness of the eye is not very great, and is most conspicuous in the conjunctiva lining the eyelids. The flow of tears is always much increased; and in severe cases, the secretion often becomes opaque and purulent. Chemosis sometimes takes place in very violent instances, and the cornea may burst and destroy vision. The headache, in this variety, is seldom very severe, and the febrile excitement is generally mild, and in slight cases altogether wanting.

Treatment.—In mild cases of this variety of the disease, general blood-letting is rarely necessary or useful. In instances attended with considerable constitutional irritation, a sufficient quantity of blood should undoubtedly be drawn, to moderate the excessive momentum of the circulation. *Leeching* rarely affords any decided advantage; when local depletion is desired, cupping on the back of the neck and over the temples is preferable. Mr. Travers condemns scarification of the conjunctiva, and bleeding from the angular vein, in the acute form of the disease, although highly beneficial in the chronic. Nevertheless, when *chemosis* occurs, and the discharge becomes puriform, considerable advantage will, in general, result from scarifying the conjunctiva of the eyelids. "One or two deep incisions being made along the inner surface of the upper or lower eyelid, a very considerable discharge of blood will immediately take place, and prove a valuable means of cure in cases of this kind. The eyelid, after the incision, ought to be alternately averted and permitted to return to its natural position, by which means the divided vessels are refilled, and thus a continued flow of blood will be produced." (Mackenzie.) In cases of this character, considerable benefit often accrues from the use of nauseating doses of tartrate of antimony, given at short intervals, so as to keep up a continued and uniform impression.

Cathartics are indispensable in this affection. The bowels must be freely opened by a full dose of calomel and jalap, or by active doses of the neutral purgative salts, and kept in a loose state throughout the course of the disease.

The usual astringent lotions do no good in this variety of the disease: indeed they often prove manifestly prejudicial. The solutions of sulphate of zinc or of acetate of lead, so commonly used in inflammations of the eye, seldom fail to increase the redness of the conjunctiva and the sensation of sand in the eye. The same observation applies to *cold* applications; for, although they generally produce temporary ease, "they are followed by reaction, with an increase of heat and pain." (Travers.) In the acute stage of the inflammation, benefit will frequently arise from the use of warm soothing fomentations to the eye. A weak infusion of poppy, or simply warm water and milk, may be used for this purpose. Emollient and soothing warm applications must not, however, be

* Med. and Phys. Journal, No. 4, 1826.

continued too long; for they tend to relax and to produce œdematous elevation of the conjunctiva. When the disease early assumes an atonic or almost solely congestive character, a few drops of the vinous tincture of opium, or of solution of zinc, or nitrate of silver, will often afford much relief. The *nitrate of silver* is decidedly the most effectual local application in this variety of ophthalmia. Four grains of this article dissolved in an ounce of distilled water, forms a solution of a proper strength; "a large drop of which is to be applied to the eye by means of a camel-hair pencil. The instant that it touches the eye the salt is decomposed, and the silver precipitated over the conjunctiva in the state of a muriate."* An abatement of the peculiar sensation of sand and of the inflammation, almost uniformly, soon follows the application of this solution. I have myself employed the nitrate of silver in this way with almost uniform advantage.

Mackenzie recommends also a solution of one grain of corrosive sublimate in eight ounces of water as a collyrium, to be used, milkwarm, thrice daily for fomenting the eyelids by means of a fine piece of linen, and allowing a few drops to pass into the eye. In cases of great severity, where the secretion is puriform, he directs "this collyrium to be injected over the whole surface of the conjunctiva, and especially into the upper fold of this membrane, by means of a syringe."

An ointment made "by levigating twelve grains of red precipitate till they become an orange-colored impalpable powder, to which an ounce of fresh butter is to be added, forms also a very useful application in this variety of ophthalmic disease." A very small portion of this ointment is to be applied along the edges of the eyelids at night on going to bed. Kopp speaks very favorably of the tincture of galbanum as a local application in ophthalmic inflammation. A compress of linen is to be moistened with this tincture and laid over the closed eyelids. I have used this application with marked benefit in several cases, after the acute stage of the inflammation had in a degree subsided.

In some instances of a general irritable habit of body, the ophthalmia will continue to grow worse under the ordinary depletory measures, "the irritability increasing as the strength fails." In cases of this kind recourse must be had to calomel and opium in combination, or opium with small doses of tart. antimon. or ipecacuanha. From three to four grains of Dover's powder, with the sixth of a grain of calomel, may be given every three or four hours, at the same time that the above exciting applications are made to the eye. *Blistering* on the back of the neck, particularly after proper depletion, will almost always assist materially in the reduction of the inflammation.

In violent and protracted cases of the disease, the inner surface of the upper eyelid sometimes becomes rough, with a species of hard fungoid elevations, resembling a state of sarcoma of the conjunctiva. Where this occurs it should be lightly touched with lunar caustic or a piece of sulphate of copper—the eyelid being held up from the eyeball for a minute or two after the application.

Ophthalmia sometimes assumes a *strictly periodical form*. The attack in such cases is usually attended with intense suffering; and under the usual antiphlogistic plan of treatment is apt to continue a very long time. In instances of this form, leeching, blood-letting, and cooling applications never fail to do harm. The appropriate means consist of the same remedies that are employed in intermitting neuralgia, or in the ordinary intermitting fever; and there can exist but little doubt that all these forms of periodical disease are congeneric affections. Quinine, bark, and arsenic, will, in general, speedily arrest the progress of the present variety of ophthalmia.†

* Mackenzie, loc. citat.

† For an interesting case of this kind, see *Journal Complement.*, Jan. 1830. See also *Med.-Chir. Rev.*, March 1830.

2. *Rheumatic Ophthalmia.*

This variety of ophthalmic inflammation is chiefly characterized by violent circumorbital pain, extending to the temples, teeth, lower jaw, and internal ear. The pain is continuous, with occasional fits of aggravation, and is almost always much more severe at night than during the day. The white of the eye is of a yellowish-red tinge, terminating abruptly at the cornea; which latter becomes dull, cloudy, and, as the disease advances, more opaque in the centre than at the circumference. According to the observations of Travers, "rheumatic ophthalmia presents a zonular arrangement of the vessels, more or less cloudiness of the aqueous humor, and a pupil displaced or drawn a little to one side." The flow of tears is at first diminished, but in the course of the disease it becomes copious. In most instances, slight abrasions of the conjunctiva and cornea occur; but these are generally so minute and superficial as readily to escape observation, unless closely inspected. In violent and protracted cases the cornea is sometimes destroyed by ulceration, and pus is secreted within the chambers of the eye.

The inflammation, in this variety of the disease, is confined chiefly to the *fibrous* structure of the eye and of the surrounding parts; and partakes in this respect of the character of rheumatism. It is excited by the same causes that give rise to the catarrhal variety; and occurs most commonly in persons of an arthritic or rheumatic diathesis. It is also particularly apt to occur from the influence of cold while the system is under the operation of mercury, or soon after the mercurial action has subsided. "It is often seen in company with, or following gonorrhœa, eruptions, or sore throat of a pseudo-syphilitic character, and the pains are allied to those which succeed to the exhibition of mercury."*

Treatment.—Bleeding very rarely affords any obvious advantages in this variety of ophthalmia. When the pulse is very active, it should, nevertheless, be moderated by venesection, in order to lessen the general phlogistic diathesis, and thereby favor the beneficial operation of the more appropriate remedies. Much advantage may sometimes be derived from one or more antimonial emetics in the early stage of the disease; and active purgatives are equally important. After the alimentary canal has been evacuated, we may exhibit a solution of tart. antimon. in nauseating doses, every two or three hours; or antimonial powder in combination with opium and calomel, so as to keep up a uniform, continued, moderate diaphoresis.† I have known much good done in this variety of disease by repeated small doses of Dover's powders. Cupping or blistering the nape of the neck is a useful auxiliary; and fomentations with an infusion of poppy heads always mitigates the pain very considerably. One of the most soothing applications to the eye, is a few drops of an aqueous solution of opium put into it several times a day, or a solution of the sulphate of morphia. Puncturing the cornea, so as to give exit to the aqueous humor, is almost always soon followed by an abatement of the inflammation and pain. The usual astringent and exciting collyria are wholly inapplicable in the treatment of this affection, and almost uniformly do injury. Mr. Wardrop recommends the internal use of cinchona in very small doses, (from five to eight grains,) if the tongue remains white after the bowels have been freely evacuated. Would not the tincture of cholchicum be beneficial in this affection?

3. *Purulent Ophthalmia.*

Acute suppurative inflammation of the conjunctiva is the most dangerous variety of ophthalmia, and generally the most difficult to manage. It occurs, how-

* Travers—A Synopsis of the Diseases of the Eye, &c., p. 129.

† R.—Pulv. antimonialis ℈i; calomel grs. iii; pulv. opii grs. iiss.—M. Divide into nine equal parts. Take one every three hours.

ever, under every grade of violence, from a mild and simple to a most severe and rapidly destructive affection. The severer cases come on suddenly, and are from the beginning attended with very severe darting pains through the eye. The eyelids swell rapidly, and often to an enormous extent—the upper one being often so much enlarged as to rest upon the cheek. The conjunctiva also becomes so much swollen by infiltration and distension of its vessels, as to rise up in an annular mass of red spongy granulations, overlapping the cornea so as almost to conceal this part. A very copious purulent secretion from the inflamed conjunctiva takes place soon after the disease is developed—and which usually issues in large drops from under the swollen lids. The edges of the eyelids are sometimes so closely pressed against each other, as to confine the matter until it accumulates and distends the lids into a large round tumor, and at last bursts forth and runs down the cheek. The pain in the head is always extremely severe, and the whole system sympathizes strongly with the local affection—the accompanying fever being of a high synochal grade, suffering conspicuous exacerbations in the evening. Under judicious treatment, this severe form of the disease usually begins to decline about the third or fourth day, and gradually subsides until the health of the eye is restored. Cases of great severity, or where the treatment is inefficient or improper, often terminate rapidly in more or less disorganization of the eye and consequent loss of vision. Sometimes every part of the ball of the eye becomes disorganized by suppuration. Much more commonly, however, the consequences are not so destructive—a greater or less degree of opacity and thickening of the cornea, or ulcerative destruction of this part, being usually the result of the inflammation. In some instances, ulceration of the proper substance of the cornea takes place beneath the conjunctiva—this membrane remaining entire. (Travers.) This "*interstitial*" ulceration of the cornea, says the author just referred to, may be either acute or chronic.—The acute variety is often crescent shaped, and passes nearly across the whole cornea. In consequence of the absorption or abrasion of the conjunctiva, directly over the ulceration of the cornea, great pain is caused by the emotions of the upper eyelid. The chronic interstitial ulcer occurs in debilitated subjects, remaining often a long time, like a slight depression or excavation, on the surface of the cornea, the restorative action of the vessels of the part being inadequate to repair the lost structure. Gangrenous destruction of a greater or less extent of the cornea may also take place in suppurative ophthalmia.

In the milder variety of purulent ophthalmia, there is little or no danger of destruction of the cornea, unless injury be done by stimulating applications. Mr. Travers says, "that a very slight haze of the cornea is the worst direct result of the mild form of the disease." In cases of this kind there is neither the intense pain nor the excessive swelling of the lids, which characterizes the violent acute form of the complaint.

There appear to be different varieties of suppurative ophthalmia, in relation to the exciting causes of the affection. The *Egyptian* ophthalmia, which is the most violent form of this disease, is ascribed to the combined effects of vicissitudes of atmospheric temperature and humidity, a hot wind loaded with fine particles of sand, and a bright and piercing light of the sun. A violent form of purulent inflammation of the conjunctiva is also excited by the application of gonorrhœal matter to the eye; and, it is said, by metastasis of gonorrheal inflammation from the urethra to the conjunctiva. *Infants* also are subject to purulent ophthalmia; but in them the disease is generally much less serious than in adults. Mr. Guthrie states that there are two varieties of infantile suppurative inflammation of the eyes: "one affecting the conjunctiva of the lids only, the other implicating the eyeball." I have repeatedly noticed these distinctions in the ophthalmia of infants; and although little or no permanent injury need be apprehended from the former variety, I have found it even more difficult to subdue than the latter. Some writers attribute this affection in infants to intestinal irritation from bile and sordes in the primæ viæ; but the opinion of

its being almost universally the consequence of the direct application of some morbid secretion to the eyes at the time of birth, is, I think, by far the most probable. I have never known a single instance of this disease occurring in infants, soon after birth, where, upon inquiry, I did not learn that the mother had been affected with leucorrhœa, or some other morbid vaginal secretion. The fact, too, that the ophthalmic discharge in cases of this kind, is capable of exciting the same disease when applied to the eyes of others, furnishes a strong argument in favor of this etiology. Mr. Ryall, whose opportunities for observation on this subject have been very extensive, states that he has repeatedly known the ophthalmia excited in nurses, "by the accidental application of the matter from the infant's eyes to their own."* Purulent inflammation of the eyes occurs, no doubt, occasionally in infants as in adults, from cold, and various irritating causes, acting directly on the eyes; but this is, comparatively, perhaps, but very rarely the case.

Treatment.—In mild cases, where the swelling, pain, and purulent secretion are not great, general blood-letting is not often necessary. In the severer form of the complaint, however, prompt and very decisive bleeding is indispensable to success. In those vehement cases, where the swelling of the lids is very great, the purulent secretion copious, the pain intense, and the pulse hard and frequent, "the instant relief," says Mr. Travers, "of a large venesection is indescribable. The pain is mitigated if not removed, the pulse softened, and the patient sinks into a sound sleep, and perspires freely. Upon inspection we observe the high scarlet hue and bulk of the swollen and fungoid conjunctiva sensibly reduced, and the cornea has a brighter aspect."† It is frequently necessary to repeat the venesection several times in the course of the first twenty-four hours, before a permanent impression is made on the disease.

In the disease as it occurs in infants, blood must be abstracted by a few leeches applied to the external angle, or under lid of the eye; and the eye should be frequently fomented with a decoction of poppy heads, a portion of which is to be injected under the lids to wash away the purulent secretion. Minute portions of calomel in union with ipecacuanha, or pulvis antimonialis, with an occasional dose of castor oil, should be given to infants laboring under this affection.‡

Topical bleeding, after the vigor of the arterial action has been moderated, by a very efficient abstraction of blood from the arm, will generally assist materially in reducing the local inflammation. From twenty to thirty leeches may be applied to each temple and around the eye. Blistering on the nape of the neck is also a very useful auxiliary: but decisive blood-letting should precede the application of the blister. One of the first and most important remedial measures, is the exhibition of an active mercurial purge, and the bowels must be kept freely moved throughout the active stage of the disease, by the daily use of full doses of one of the neutral purgative salts. No nourishment, except the simplest mucilaginous fluids, or toast-water, must be allowed; and in very vehement and rapid cases, total abstinence from any nutrient ingesta should be enjoined, during the first two or three days. Along with blood-letting and active cathartics, nauseating doses of tartar emetic are, in general, decidedly beneficial. They should be given in small doses every hour or two, so as to keep up a continued impression on the stomach. During the acute period of the inflammation, emollient fomentations, such as warm water, or infusion of the white poppy heads, will assist in mitigating the pain and promoting resolution; but all astringent and cooling applications are injurious. By the prompt and active employment of these antiphlogistic measures, the pain, irritation and swelling usually begin to subside about the third or fourth day, and the discharge becomes gleety at the same time that the conjunctiva assumes "a pale and flabby appearance." If,

* Dublin Transactions, vol. iv.

† Travers, loc. cit., p. 265.

‡ R.—Calomel grs. ii.
Pulv. antimonialis grs. viii.—M. Divide into eight equal parts. Give one every four hours.

when the inflammation has thus in part subsided, the cornea appear clear and bright, nothing need be apprehended as to the safety of the eye. Recourse must now be had to the exhibition of tonics and astringent and invigorating collyria. It would appear from the experience of Mr. Varlez, surgeon of the Military Hospital at Brussels, and of Mr. Guthrie, that the *chloruret of lime* forms the best local astringent application we possess in this variety of ophthalmia. The former of these surgeons states that he has employed this article in more than four hundred cases of purulent ophthalmia with uniform success. After the local and general inflammatory condition is moderated by decisive depletion, a solution of this salt is to be applied to the inflamed conjunctiva. He usually applied it in the proportion of a scruple to an ounce of distilled water; but when the inflammation continues, and when the patient bears it without complaining, it may be used, he says, to the extent "of three or even four drachms in the same quantity of water."* It has been found equally beneficial in the purulent ophthalmia of infants. In two cases of this variety of the disease, I derived the most signal advantage from injecting into the eye a solution of ten grains of the chloruret of lime to an ounce of water, repeated three times daily. The nitrate of silver, in the proportion of from two to four grains to an ounce of water, forms also an excellent local astringent in this affection. A few drops of this solution should be introduced into the eye twice daily. In the purulent ophthalmia of infants, after leeching, emollients, purging, and antimonials, have been employed, a weak solution of this article injected under the eyelids, is generally soon followed by the most favorable effects. Mr. Ryall says, that when the "discharge becomes profuse, assuming a greenish color, all warm fomentations and cataplasms must be laid aside, and a solution of the nitrate of silver, in the proportion of two or three grains of the mineral to an ounce of the distilled water, should be frequently and briskly injected between the lids."† Various other astringent and exciting lotions have been recommended after the acute character of the inflammation has been subdued.‡ A weak solution of alum, one grain to an ounce of water, is recommended by Travers. Others advise the application of alum-curds confined between two folds of thin linen; and Ware speaks favorably of the following solutions: ℞.—Sulphat. cupri., bol. arm. āā grs. viii; camphoræ grs. ii; misce et affunde aq. bullient. ℥viii. At first a drachm of this solution must be mixed with an ounce of water, and injected forcibly under the eyelids; the strength being gradually reduced in proportion as the inflammation subsides. M. Jahn, of Meinengen, speaks very favorably of a solution of the chloride of gold, as a collyrium in the purulent ophthalmia of children. He says it is equally beneficial in scrofulous, gouty, and rheumatic inflammation of the eyes. He uses it according to the following formula.§

Tonics, such as the cinchona or quinine, with the sulphuric or nitric acids, must be employed to sustain the patient's powers, after the inflammation has been reduced, and the conjunctiva appears pale and flaccid. "If, when the lowering practice has been pushed to the extent of arresting acute inflammation, the patient being at the same time sunk and exhausted, the cornea shows a lack-lustre and raggedness of its whole surface, as if shrunk by immersion in an acid, or a gray patch in the centre, or a line encircling or half encircling its base, assuming a similar appearance, the portion so marked out will infallibly be detached by a rapid slough, unless by a successful rally of the patient's powers, we can set up the adhesive action so as to preserve *in situ*, that which may remain transparent. (Travers.)

* London Med. and Phys. Journ., 1827. † Dublin Transactions, &c., vol. vi.

‡ [The most prompt relief in cases of violent suppurative ophthalmia is afforded by passing a solid piece of lunar caustic rapidly over the inner surface of the everted tarsi, even in the acute stage.—Mc]

§ ℞—Chloride of gold grs. ii, distilled water ℥vi. Two or three drops of this solution must be instilled into the eye, and a compress wet with it applied over the eye.—*Rust's Magazine*, vol. xxviii.

4. *Scrofulous Ophthalmia.*

This variety of the disease occurs most commonly in children, and is frequently the first manifestation of the scrofulous diathesis. Its most characteristic symptoms are: extreme sensibility of the retina to the impression of light; profuse serous secretion or flow of tears; and a muco-purulent secretion from the glands of the tarsi, which, during sleep, agglutinates the eyelids. The pain is not often great, unless a bright light is suffered to fall upon the eye; nor is the redness of the conjunctiva generally very conspicuous. In recent and acute cases, effusion of serum sometimes occurs around the cornea, "elevating the conjunctiva into a circular vesication, about a line or more in breadth, frequently occupying the entire margin of the cornea, and exhibiting a peculiar reddish-brown appearance."* In many instances of this acute character, minute vesicles appear scattered over the cornea and the conjunctiva of the sclerotic coat. "These pustules vary in size, according to the part or the conjunctiva on which they appear, being commonly smallest on the cornea, and increasing as they approach the angle where that membrane is reflected over the inner superficies of the lids, and may be considered as a distinguishing symptom of this disease." (Jeffries.) These vesicles break, in some cases, and form ulcers; and if the inflammation be not checked, these ulcerations often gradually penetrate deeper into the cornea, until they form an opening into the anterior chamber, and give exit to the aqueous humor.

The disease does not, however, often occur in this acute form, the majority of instances met with being of a strictly chronic character, the vessels of the conjunctiva "remaining in a state of passive congestion and engorged with red blood," with small indolent ulcerations, or nebulæ of the cornea, attended with a constant profuse flow of tears, and with such distressing intolerance of light, that the patient keeps the eyes constantly closed, and lies with the face downwards or keeps the hands continually applied over the eyes to exclude the light as much as possible. In many instances of this chronic variety of the disease, *tinea ciliaris* and *lippitudo* occur: small pustular ulcerations appearing along the roots of the eyelashes, from which a muco-purulent fluid exudes by which the edges of the eyelids are glued together; or the edges of the eyelids are red, and excoriated.

Mr. Christian, consulting surgeon of the Liverpool Ophthalmic Infirmary, has described a variety of scrofulous ophthalmia, which he calls *porriginous*, from the disease being usually preceded by a porriginous "eruption of pustules on the face and head." These pustules go through the various stages of suppuration, ulceration, and desquamation; and if the eruption in its pustular form, shall have disappeared before the inflammation of the eyes has commenced, still there will almost always be found some traces of the original disease in the form of scabs, or fissures behind the ears, at the commissures of the palpebræ, or at the junction of the alæ nasi with the cheeks."†

This appears to be the same variety of scrofulous ophthalmia that has been described by Mr. Wardrop, under the name of exanthematous ophthalmia. Mr. Wardrop considers it as specifically distinct from the scrofulous form of the disease, though he admits that it very frequently occurs in subjects of a scrofulous habit. Neither the symptoms nor the treatment of this disease, however, differ so materially from those peculiar to scrofulous ophthalmia, as to justify the opinion that they are essentially distinct in their characters. "Eruptions of the scalp and discharges behind the ear, so frequent in children, are the affections with which this ophthalmia is most commonly connected. These diseases alternate with the disease of the eyes, the latter becoming affected when the eruption or discharge disappears; whilst, when either of *these* returns, the eyes recover.

* Cases of Surgery, &c. &c. By Henry Jeffries, Esq., senior surgeon to St. George's and St. James's Dispensary. Lond., 1820.

† Glasgow Medical Journal, No. i.

This ophthalmia also sometimes succeeds measles, scarlet fever, and other exanthematous diseases, but usually appears a considerable time after these affections have subsided. The symptoms of the exanthematous ophthalmia are very characteristic; for, besides being connected with eruptions and confined to young people, the excessive intolerance of light, the enormous secretion of tears, and the relief from forcibly squeezing the eyes, are symptoms quite peculiar. The patient can scarcely hold up his head, and if he is desired to open his eyes, he is affected exactly as if he were looking on a mirror, reflecting a bright sunshine, every attempt causing a profuse gush of tears, and being instantly succeeded by a violent and involuntary squeezing of the eyelids and knitting of the brows. He excludes all light, not only by holding down his head and squeezing the eyelids together, but by pressing a handkerchief firmly on them or by resting his face against a chair in some dark corner of the room. The intolerance of light is always more severe in the morning; but in the afternoon it sometimes remits so much as to allow the patient to open his eyes and see to a very considerable degree for some hours. The tears are of an acrid and irritating quality, so that the cheeks, alæ of the nose, and lips, often become inflamed, swelled, and sometimes covered with pustules and cutaneous ulcerations."*

Now this very graphic account of the symptoms answers in every particular to the descriptions given by authors of scrofulous ophthalmia, and it certainly describes the disease which I have always considered as the strumous, or scrofulous form of ophthalmia.

Treatment.—General bleeding rarely becomes necessary in strumous ophthalmia. In recent and acute cases, however, *leeching* should be occasionally practised, until the pain, irritation and inflammation are moderated. *Purgatives* are indispensable in this affection, where the abdomen is tumid and tense, and the alvine discharges of an unnatural character. Calomel, combined with rhubarb or jalap, should be given every two or three days, in doses sufficient to cause pretty copious purging; or a few grains of calomel may be taken in the evening, and followed next morning by a dose of castor oil or of senna infusion. This active course of purgation should be continued until the quality of the alvine evacuations is manifestly improved. After this has been effected it will be sufficient, in general, to admintster a moderate dose of calomel and rhubarb every four or five days. In the more chronic form of the disease, also, active purgation is not, in general, beneficial. The bowels should be kept in a loose state, however, by small doses of rhubarb or castor oil, or some other mild laxative. In many cases, there is considerable gastric disorder, the appetite being variable and capricious—sometimes much depressed and at others voracious. Where this is the case, *emetics* may be accounted among our most useful remedies. An aqueous solution of tartar emetic appears to be the best article for this purpose. The emetic may be repeated every third or fourth day, during the active state of the inflammation.

To promote the regular performance of the various excretory functions, small doses of calomel with pulvis antimonialis should be given at night, and where the system is very irritable, it will be proper to add a few grains of Dover's powder.† In a few instances I have derived conspicuous benefit from the use of sarsaparilla syrup, with a very minute portion of muriate of mercury, but in many instances it failed entirely in doing any good. When there is considerable general irritation, a solution of tartar emetic, given every two or three hours, in doses just sufficient to cause a slight nauseating impression on the stomach, will sometimes prove serviceable. After the alvine discharges have been brought to a healthy state, by the mercurial purgatives, tonics will often afford much benefit.

* Transact Med.-Chirurg. Society of Edin., vol. ii.

† ℞.—Calomel grs. iv.
Pulv. antimon.
—— doveri, āā grs. viii.—M. Divide into four equal parts.

Wardrop recommends the use of the carbonates of soda or potass, either singly or in combination with small portions of rhubarb or the milder bitter infusions. "In some instances the mineral acids have been very useful, and also the preparations of iron." Quinine, however, is decidedly the most effectual tonic in this species of ophthalmia, after a proper course of mercurial purgation. In recent and acute cases, the diet should be simple and unirritating: such as liquid farinaceous preparations, or thin animal broths; but in the more chronic variety of the disease, where the system is irritable and feeble, a more nourishing, though plain and digestible diet, must be allowed, in order to support the vigor of the system. Besides the general remedies already mentioned, various other articles have been recommended for the treatment of this affection; amongst which the muriate of *barytes* and *iodine* are the most important. Hufeland, in a small monograph on the use of the former of these articles in scrofula, relates some interesting examples of this variety of ophthalmia, which yielded to its powers.* I have employed this remedy in several cases with manifest advantage, and it appears to be worthy of more attention than it has of late years received. The best mode of exhibiting this substance is in solution. A half a drachm of the muriate should be dissolved in an ounce of distilled water; of this solution, from thirty to sixty drops may be given three or four times daily to an adult; and for children, from one to two years old, the dose is from ten to twenty drops. Hufeland says, that the best vehicle for administering this remedy is a ptisan prepared of lig. guaiac., rad. gramin., sarsaparilla, and dulcamara. I have also prescribed the iodine in a few cases, and its use was continued for more than three months, without having in a single instance obtained any perceptible advantage from it. Nevertheless, no inconsiderable number of cases have been reported in which this article is alleged to have proved decidedly beneficial, and from its well-known influence over strumous glandular enlargements, it is certainly entitled to attention as a remedy in the present affection. Dr. Mackenzie, of Glasgow, speaks in the most favorable terms of the employment of the sulphate of quina in strumous ophthalmia. "After many years' experience," he says, "in the treatment of strumous ophthalmia, and a trial of numerous and various internal remedies, I have found none so useful as *quina*. In most instances its effects have been very remarkable; and, indeed, although I have met with a few cases which appeared to resist its beneficial influence, in most of the little patients to whom I have administered it, it acted like a charm. The dose which I employ is generally one grain thrice a day; and in very young children, half a grain; and in adults two grains."† The Peruvian bark was strongly recommended by Fothergill and Fordyce‡ in the treatment of this affection, but its powers are vastly inferior, in this respect, to the sulphate of quinine. (Mackenzie.)

With regard to the employment of collyria, and othor local applications, little of permanent advantage is to be derived from them. As palliatives, however, slightly astringent lotions, such as weak solutions of nitrat. argent., sulph. zinc., or sulphat. cupri, may be beneficially used where the inflammation and pain are considerable; or a decoction of white poppy heads, "with a considerable quantity of extract of conium dissolved in it, (half an ounce to a quart of the decoction,) applied to the eye five or six times daily."§ I have found a solution of the nitrate of silver, in the proportion of four grains to the ounce of distilled water, to answer better than any other application of this kind. A few drops of this solution is to be instilled into the eye once or twice daily.‖ Mackenzie

* Darstellung der Medicinischen Kräft, der Salzsauren Schwererde. Von Dr. Christ. W. Hufeland. Berlin, 1794.

† On the Utility of Sulphate of Quina in Strumous Ophthalmia, with Cases. By Wm. Mackenzie, one of the Surgeons of the Glasgow Eye Infirmary.—*Glasgow Med. Journal*, No. 1.

‡ Lond. Medical Observations and Inquiries, vol. i.

§ Med.-Chir. Rev., Dec. 1822, p. 538.

‖ [I frequently resort to the mode of applying the nitrate of silver to the external integuments, so as to blacken the cuticle over the lids and around them in all irritable and painful inflamma-

speaks well of a collyrium composed of one grain of *muriat. hydrarg.* dissolved in eight ounces of water. When the disease is chiefly confined to the tarsi, (ophthalmia tarsi,) benefit may be obtained from the application of red precipitate ointment (fifteen grains to an ounce of lard), to the edges of the lids. Mr. Jeffries observes, that the small pustules which occur on the cornea and conjunctiva, should by no means be opened by art, as they are then apt to degenerate into ulcers, an occurrence which also greatly aggravates the pain, inflammation, and intolerance of light, and increases the risk of ultimate loss of vision from destruction or opacity of the cornea.

Blisters very seldom procure any advantage in strumous ophthalmia. Indeed, they often do harm, by the pustular inflammation which is apt to occur around the blistered part, and the consequent additional source of general and local irritation which is thus created. The insertion of a *seton* in the back of the neck is much more useful than vesication in such cases. After the acute character of the disease has subsided, the establishment of such a drain will almost always produce the most favorable effects. In four cases which had resisted for many months the ordinary remedies, the disease gradually disappeared entirely under the influence of a seton in the nape of the neck.

5. *Syphilitic and Strumous Iritis.*

Inflammation of the iris may be produced by various causes, but its occurrence from syphilis is incomparably the most frequent.

A vascular zone around the margin of the cornea, attended with cloudiness of the humors; constriction of very limited and sluggish motion of the pupil; great intolerance of light; obscure vision; a continued deep-seated aching pain in the globe of the eye, forehead, and circumorbital parts; and the appearance of very fine red lines and specks upon the iris, are the principal phenomena characteristic of this variety of ophthalmia. In the progress of the disease, adhesion takes place between the fibres of the iris, "the pupil losing its thin flowing edge, and becoming thick, stunted, and gibbous." In slight cases, no other appearance of inflammation occurs in the eye, the conjunctiva remaining free from redness. In the more acute instances, however, the sclerotica is usually of a rose-red color, shading off gradually towards the circumference. The pain, in instances of this kind, is often fitful, and is particularly severe in the evening or early in the morning. The usual sensation, however, (except during these evening or morning exacerbations,) is a feeling of constant painful pressure in the globe of the eye, with more or less of an aching pain in the temples, bone of the cheek, and forehead. In some instances, the pain in the eye is pulsatile, "marking every injection of the ophthalmic artery." In very acute and violent cases of iritis, lymph is deposited on the iris, appearing in small yellowish-red elevations on its surface; the pupil usually becoming angular and misshapen, and sometimes entirely blocked up by a layer of lymph.

Mr. Travers divides iritis into *primary* and *secondary*. The primary variety is commonly the consequence of syphilis, or of cold while the system is under the influence of mercury, and is distinguished from the secondary variety by "the more sparing vascularity of the conjunctiva, and the consequent more distinct appearance of the vascular corona round the cornea." It usually comes on rather suddenly; is attended with very severe pain in the orbit and head almost as soon as it commences; and "the vision is more quickly and completely dimmed. In the *secondary* form the inflammation gradually extends from the contiguous tunics to the iris; the conjunctiva is vascular and often rose-red; the cornea much clouded; the pupil retains its natural shape, or is but slightly

tions of the eyes. During the last three or four years the London surgeons have generally depended upon this mode of applying their popular remedy to the eyes, instead of using it as a collyrium.—Mc.]

deformed; the pain is confined in a great measure to the eyeball, and is not often very severe, but the intolerance of light is generally very considerable." (Travers.)

When the disease is violent, and continues unchecked in its course, the iris projects forwards, and uniting with the cornea, produces corneal staphyloma. If the inflammation extends to the choroid membrane, retina, and vitreous humor, vision will inevitably be lost.

Strumous iritis is most apt to occur in children between the ages of six and eighteen, of a delicate habit, "fair complexion, light hair, and blue eyes." The cornea acquires a misty or slightly opaque appearance, with patches of red vessels usually appearing on its edges. A zone of pink vessels is formed around the cornea in various situations. The conjunctiva is but slightly red; and on close inspection, the vessels of the sclerotica are found minutely injected, and running in straight lines to the margin of the cornea. Profuse lachrymation occurs, with distressing intolerance of light. The iris is nearly inactive, and vision is obscure. "The eyebrow appears to project considerably before the eye; the muscles (if one eye only be affected), become thicker and stronger than those of the opposite side; from their powerful contraction to exclude the light, and give to the countenance a distorted appearance. The pulse is generally quick and irritable; the appetite uncertain; the secretions unhealthy; the skin dry and harsh, but variable in temperature; the heat of the scalp being oppressively great, whilst the extremities are often chilled with cold."

Treatment.—Although mercury may be regarded as the principal remedy in this variety of ophthalmic inflammation, yet, general and local depletory measures, free purgation with calomel and jalap, and nauseating doses of antimonials, are essential auxiliaries in the acute stage of the disease. Without mercury little or nothing can be effected towards arresting the progress of the inflammation. It should be given to the extent of producing ptyalism, except in subjects of a debilitated and worn-down constitution, where a more moderate mercurial action should be established, and the system supported by a nourishing but unirritating diet. Great care must be had to avoid taking cold while under the mercurial influence in this affection. Belladonna is a highly important remedy in this species of ophthalmia. Without the use of this narcotic, says Mr. Guthrie, "complete success can rarely be obtained." The extract must be thickly smeared on the eyelids and eyebrows every night. After the inflammation has been considerably reduced, and the intolerance of light removed, a very small portion of weak precipitate ointment introduced into the eyes twice a week, will often aid materially in completing the cure. Bleeding, cupping, leeching and blistering are all wholly ineffectual and not unfrequently decidedly injurious. (Guthrie.) Mr. Middlemore, assistant surgeon of the Birmingham Eye Infirmary, has published a statement which would seem to show that much advantage may be obtained from the use of the spirits of turpentine in this affection.* Mr. Carmichael and Mr. Guthrie have also given reports illustrative of the usefulness of this remedy. Mr. Middlemore asserts that he gave it with advantage to patients, who, from delicacy or constitutional idiosyncrasy, were unable to use mercury to the extent of producing salivation. Where the acute symptoms had been relieved by mercury, the turpentine given in drachm doses, two or three times daily, manifested a peculiarly excellent effect. He insists strongly on the early employment of this remedy in inflammation of choroid and retina.

Strumous iritis is extremely obstinate in its duration. In delicate children, very small doses of calomel with prepared chalk may be given every evening, and a grain of quinine twice during the day. The quinine will often do more good in cases of this kind than any other remedy we possess. A seton in the nape of the neck, or a small issue on the arm, will in general contribute considerably to the reduction of the inflammation. Suitable clothing to keep up the regular warmth and action of the skin is an important auxiliary. The patient

* Medico Chirurg. Rev., July 1830.

should also be allowed moderate exercise in the open air; and a simple digestible and nourishing diet is to be enjoined.

CHAPTER XVII.

OF THE CUTANEOUS PHLEGMASIÆ.

Exanthemata.

The term *exanthemata* is derived from the Greek word ἐξανθέω, effloresco; and is employed to designate those acute *contagious* affections, in which an efflorescence or eruption appears on the surface of the body. The exanthematous fevers are of a strictly *specific* character:—that is, each affection of this kind has its specific cause, and cannot, so far as we know, be produced by any other cause or combination of causes. In all of them, fever exists as the primary or essential disease—the eruption being a secondary affection, and the immediate consequence of the specific febrile excitement. Unless interrupted by constitutional idiosyncrasy, or adventitious influences, each of these diseases has its determinate course, both in relation to the duration of its stages and the succession of its characteristic phenomena. They are all communicated by contagion; and they possess the power of destroying the susceptibility of the human organizations, to the subsequent morbific influence of their respective contagions, although instances do occasionally occur in which this power is more or less effectively opposed by the system, and in which, therefore, a second attack is possible.

Sect. I.—*Variola.*—*Small-pox.*

It is not known at what period the small-pox made its first appearance. In the writings of the Greek and Roman physicians, we find nothing which could lead us to believe that they had any particular knowledge of this devastating malady, although we can scarcely doubt that its origin was of a much earlier date.* The Arabian physicians were the first who gave a distinct description of this disease; and it is to the small work of Rhazes, who lived about the beginning of the tenth century, that we must look for an account of its early history. It may be collected from the writings of Rhazes and others, that small-pox was probably at first brought from Ethiopia into Arabia, and that it was thence conveyed into the

* Rhazes, indeed, refers to some expressions in the writings of Galen, which would seem to show that small-pox, though not described, was known by this Roman writer. "As to those physicians," says Rhazes, "who affirm that the most excellent Galen has made no mention of the small-pox, and therefore that he did not know this distemper, surely they have either never read his works at all, or only very cursorily; nay, most of them do not know whether what he plainly says of it is to be understood of that disease. For Galen, in a certain treatise, says: *this * * * does good against the small-pox.* And in the beginning of the fourteenth book of *pulses*, he says, that *the blood is putrefied in an extraordinary degree, and that the inflammation runs so high that it burns the skin; so that small-pox and pestilent carbuncle are bred by it.* And in the ninth treatise of the book *of the use of the Parts*, he observes, *that the superfluous parts of ailments which are not turned into blood, and remain in the members, putrefy, and in time increasing, do ferment: whence, at last, are generated the pestilential carbuncle, the small-pox, and confluent inflammations.* Lastly, in the fourth part of his commentary upon the *Timæus* of Plato, he says, that the ancients gave the name of φλεγμονὴ to everything which produces redness, as the carbuncle and *small-pox*."—*Treatise on the Small pox and Measles.* By Abubecker Rhazes, chap. i. Translated by Thomas Stack, M. D., F. R. S.

Levant, Spain and Sicily, by the Saracens, during their hostile irruptions into these countries.* In the eleventh and twelfth centuries it gained vast ground, during the wars waged by the Christian potentates against the infidel Saracens for the recovery of the Holy Land. From that time forwards, its desolating visitations were frequently renewed, in every part of Europe, and there is, perhaps, no single disease with which the ALMIGHTY has thought it good to afflict mankind, which has carried off so many victims to the grave as the present one.†

Small-pox is divided into two varieties—namely, the *distinct* and *confluent*. In the former, distinct, elevated, distended, and circular pustules are scattered over the surface of the body; in the latter, the pustules are exceedingly numerous, depressed, irregularly circumscribed, and confluent or coherent. There exists, however, no essential difference between these varieties; the division is altogether arbitrary; for, in some instances, the pustules are confluent on the face, while on the rest of the body, they are distinct.

The time which elapses between the reception of the variolous virus, and the first manifestations of its influence on the system, is said to vary from about seven to twenty days; although by far the most common period of its inception is between the ninth and fourteenth days. During this period of *incubation*, no obvious symptoms of indisposition occur—the individual retaining an apparently good state of health. It is stated by some that the disease is apt to be most violent when this period is of short duration.

Course and symptoms of the distinct variety.—The disease commences with a feeling of languor, weariness, aching pains in the back and lower extremities, slight creeping chills; with flushes of heat and pain in the forehead. More or less nausea and vomiting, attended with great thirst, *pain in the epigastrium*, and some degree of soreness in the fauces, speedily ensue. When the fever is completely developed, the skin and face are dry, the tongue white, and generally red at the point, the bowels torpid, and the urine scanty and of a deep red color. During the first and second days of the fever, slight hemorrhages from the nose are apt to occur; the mind often becomes dejected and confused, and towards the end of the third day, the tongue usually acquires a bright red color. Shortly before the appearance of the eruption, an unusual tendency to perspiration generally occurs in adults, and frequently much drowsiness, and sometimes coma, supervene at this period. In children the eruption is sometimes preceded by convulsions; but the tendency to free perspiration very rarely occurs in them. In many cases, the hands and feet are cold throughout the whole course of the disease, more especially in very young children. The coldness of the extremities has by some been considered as the most certain diagnostic symptom of the eruptive variolous fever; but the most frequent and characteristic phenomena of this fever are the pain and soreness to pressure of the epigastrium, and the vomiting. (Philip—*Febrile Diseases.*) Both in adults and in children, a considerable increase of the febrile symptoms usually takes place a short time before the eruption begins to appear; and in some instances, severe cramps in the legs occur at this period.

Towards the end of the third, or the beginning of the fourth day from the commencement of the disease, the *eruption* begins to make its appearance. The pustules appear first on the forehead, and on the parts about the mouth and nose—next on the forearms and upon the breast and abdomen—and last of all on the

* It would appear, that small-pox was known in Europe as early as the seventh century. The word *variolæ* occurs repeatedly in some manuscripts discovered by Dr. Woodville, in the British Museum, and in the Cottonian collections, written about the close of the eighth century; and Marius Aventicensis, Bishop of Lausanne, in the seventh century, uses these words: *Hoc anno variolæ cum profluvio ventris, Galliam, Italiamque valde afflixit.*—*Gregory's Practice*, vol. i. p. 197.

† It has been estimated, that before the introduction of vaccination, 450,000 individuals died annually of small-pox in Europe.—*Richter's Thérapie*, b. ii. p. 302.

lower extremities; so that in about twenty-fours the eruption is completed. The eruption consists at first of red points, which by the middle of the second day, present small elevations, with inflamed bases, which as yet discharge no serous fluid when punctured, but "the cuticle appears distended by a sort of semitransparent plastic lymph." Towards the end of the second day, some of these pustules present central depressions; and on the following day this characteristic depression becomes conspicuous in nearly all of them. Where there are but few pustules, they often remain elevated and pointed, with but a very slight central depression; but where they are numerous, they assume an umbilicated form, or flattened with a distinct depression in the centre. The fluid appears at first in the central points, and is of a limpid and serous character. The pustules continue gradually to increase in size, at the same time that their umbilicated form becomes more and more conspicuous. About the fourth day they assume a whitish color, and become surrounded by a pale red areola. When the pustules are very numerous, these areolæ run into each other, and give a uniform appearance of redness to the interstitial spaces. The limpid fluid which appears at first in the central part of the pustules, gradually becomes more and more abundant—extends towards the basis of the pustule—and changes from its serous to a purulent character. This change occurs between the fifth and seventh day, and marks the commencement of the stage of

Suppuration.—In the *distinct* variety, the fever which precedes and accompanies the eruption always remits greatly, and frequently disappears entirely, as soon as the eruption is completed. When suppuration commences, however, the febrile symptoms usually reappear. As the process of suppuration goes on, the pustules become distended with pus, and, losing the flattened form, acquire a spherical shape. About the eighth day, when the crop of pustules is pretty numerous, the face begins to swell; the upper eyelids sometimes becoming so tumid and puffy as to close the eyes entirely. Towards the end of the tenth day the swelling of the face begins to subside, but instead of this, considerable tumefaction occurs in the hands and feet, and the interstitial spaces over the whole body become more or less swollen, tense and sore. The period of suppuration is almost invariably attended with soreness in the fauces, and where the pustules are numerous, with a copious secretion of viscid saliva. In some instances, the increased flow of saliva occurs with the commencement of the eruption, but its usual time of occurrence is after the suppurative stage has supervened. This secretion generally becomes so thick and viscid, that it is spit out with considerable difficulty, and renders swallowing difficult. On examining the mouth and fauces, they are found swollen and of a bright redness; and from the Eustachian tubes becoming closed by the tumefaction, more or less obtuseness of hearing usually occurs. During the latter period of the suppurative stage, a strong and very peculiar odor rises from the patient's body, and this exhalation continues until the process of desiccation is completed. When the tumefaction of the face is very considerable, more or less drowsiness or oppression often occurs, and in some instances diarrhœa supervenes towards the completion of the suppurative process. The *secondary*, or suppurative fever, varies in violence and duration, according to the copiousness of the eruption, and the activity of the suppuration. In mild cases of the distinct variety of the disease, the secondary fever rarely continues longer than two or three days, and is seldom attended with symptoms of severity. The suppuration, like the appearance of the eruption generally, begins on the face, and lastly on the hands and feet. As the disease advances, the pustules gradually become yellower and more opaque, and arrive at their full state of maturity about the twelfth day.* After the pustules have

* If a mature pustule be opened, which had previously presented a well marked central depression, a yellowish pus will be found below, presenting a small, white, umbilicated disk, perfectly resembling, in form and size, the pustule before the pus had altered its shape.—*Cazenave. Practical Synopsis of Cutaneous Diseases*, p. 142.

acquired their perfect state of development, they sometimes remain stationary for several days; but more commonly a brownish spot makes its appearance on the centre of each pustule as soon as the process of suppuration is completed, acquiring at the same time a rougher and deeper yellow aspect. Soon after the occurrence of this change, the pustules begin to shrink, becoming gradually drier, browner and harder, until the matter is converted into a brown crust. *Desiccation* always commences on the face, "this part being often covered with scabs, when the pustules on the extremities have scarcely arrived at maturity." When the scabs fall off, they leave a vividly red surface, which disappears very gradually. In mild cases of distinct small-pox, the suppuration seldom destroys the skin and subcutaneous cellular tissue, and the skin therefore does not become pitted or marked. In the more severe instances of this variety, however, the cicatrices remain with more or less distinctness—becoming more and more visible, as the redness, which remains after the falling off of the scabs, gradually disappears.

Confluent small-pox.—The pain in the back and extremities during the eruptive fever, is almost always much more severe in the *confluent* than in the distinct variety of the disease; and, in general, all the febrile phenomena are usually more violent in the former than in the latter. The heat of the skin is very great; the thirst exceedingly urgent; the tongue dry, harsh, and sometimes covered with a dark brown or blackish fur, and the nervous system is often much affected. In the distinct variety, the eruptive fever is almost invariably of the synochus or synocha grade. In the more aggravated instances of *confluent* small-pox, it often assumes a typhous character; although in the majority of cases, the *eruptive* fever is highly synochal. The tendency to copious perspiration, often so conspicuous in the distinct small-pox, is rarely observed in the confluent variety; but profuse diarrhœa sometimes occurs just before the appearance of the eruption, and still more commonly during the suppuration. It has been observed, that the secretion of saliva, commonly so abundant in this affection, is usually very trifling, or almost entirely suppressed when diarrhœa attends.

In general the eruption appears at an earlier period in the confluent than in the distinct variety of the disease; and the time of its appearance is altogether much more regular in the former than in the latter. In some instances, the pustules come out as early as the second day, and, occasionally, not until the fourth or fifth day after the commencement of the fever. In many instances of confluent small-pox, a roseolous rash or efflorescence precedes the variolous eruption—a phenomenon which is occasionally observed also in the distinct variety. When the eruption is confluent, the small red papular points which appear at first, run into each other, and form "a large red, tumefied, and somewhat rugous surface." The patient at the same time is very drowsy, and the carotids beat strongly.

The pustules of *confluent* small-pox are commonly irregular in shape, and much less elevated than in the distinct small-pox; and the parts not covered with the eruption are pale and flaccid. The central depression is generally inconspicuous; and about the third day the pustulated surface becomes "covered with a kind of subcuticular whitish pellicle." The tumefaction of the face and hands, as well as the soreness in the fauces and the flow of saliva, are generally very great in the confluent variety. The reverse, however, is occasionally observed; for, in some instances of *confluent* small-pox, these symptoms are but very slight. When the suppuration is completed, a very manifest aggravation of the febrile symptoms occurs, constituting what is termed the *suppurative* or secondary fever. The matter in the confluent pustules is of a whitish-brown and sometimes of a dark color, and of much less consistence than in the mild form of the disease; and, in some instances, it acquires a corrosive character. About the eighth or ninth day of the eruption, the matter begins to escape from the pustules, and hardens on the surface into extensive brown crusts, which fall off at periods varying from the fifth to the fifteenth day from their formation, and are succeeded by desquamations which finally leave deep marks or pits, which are often so united as to form "seams that traverse the face in all directions." Both in the

distinct and confluent varieties of the disease, great itching attends the period of desiccation.

The eruption of small-pox is not confined to the external surface of the body. The pustules occur also on the mucous membrane of the mouth, larynx and trachea, and on the tongue—giving rise to more or less copious ptyalism, hoarseness, painful swallowing, difficulty of breathing, cough, viscid expectoration, and perhaps diarrhœa. The disease is sometimes from the commencement of a highly inflammatory character. It begins with strong chills, succeeded by intense febrile heat; a frequent, full, and hard pulse; high-colored and scanty urine; flushed countenance; sometimes delirium; and, in children, often convulsions. Internal inflammations, particularly of the brain or lungs, are apt to supervene in cases of this kind. When the former organ becomes the seat of the inflammation, violent delirium, coma, convulsions, or apoplexy ensue. Thoracic inflammation is indicated by the occurrence of pneumonia, pleuritis, or effusion into the lungs. The eyes, too, are apt to become inflamed, and the parts not covered with pustules are vividly red and much tumefied.

In some instances the attending fever, even in the distinct variety of the disease, is typhoid. The chilly stage is unusually protracted; the pulse remains small, weak, and frequent, and the patient complains of much muscular prostration. Various symptoms of nervous disturbance are apt to occur—such as vertigo, faintness, twitching of the tendons, and even convulsions. The urine is colorless, and the face pale and sunken. The pustules come out slowly and irregularly, appearing simultaneously on every part of the body, and sometimes first on the extremities, and are often congregated in irregular clusters. The eruption sometimes disappears on some parts without passing into the pustular state; and slight causes, such as cold or mental agitation, may even occasion the whole eruption to recede; in which case, convulsions, or apoplexy, or fatal congestion and effusion into the lungs, are apt to supervene. Suppuration goes on slowly and often imperfectly, the pustules becoming filled with a thin watery pus. The intermediate skin is seldom much tumefied, and remains pale. In the advanced period of the disease, the swelling of the face and extremities sometimes subsides suddenly, and the patient dies apoplectic. *Desiccation* generally commences several days earlier than in the ordinary course of the disease; and at this period the fever is apt to become much aggravated.*

The disease sometimes manifests a highly malignant or putrid character—more especially the confluent variety. The heat is acrid (calor mordax); the perspiration clammy and offensive; watery diarrhœa often occurs; the face is bloated and red; the eyes watery and inflamed; the appearance of the eruption and its progress are irregular. The pustules commonly acquire a dark or livid hue; are surrounded with brown or almost black margins; and become filled with a bloody serum instead of pus. Colliquative hemorrhages, particularly from the nose, are common. Desiccation leaves very dark or black crusts, beneath which phagedenic ulcerations are not unfrequently formed.†

When the small-pox attacks females in the state of pregnancy, it frequently gives rise to abortion, more especially during the early periods of utero-gestation.

Such are the usual course and phenomena of the distinct and confluent varieties of small-pox. It is subject, however, to considerable irregularity, both in relation to its general progress and the character of its particular symptoms. But the most remarkable variety of anomalous small-pox is that which has been termed the *crystalline*, and in which, instead of pustules containing purulent matter, the eruption consists of phlyctenæ, or vesicles filled with a colorless transparent serum. The phlyctenæ soon became pale, and although not confluent, are never surrounded by inflamed margins. This variety of the disease is of a most dangerous character. In many instances, no tumefaction of the face or hands occurs, a circumstance which is particularly indicative of great violence and

* Richter's Specielle Thérapie, b. ii. p. 299.

† Ibid., p. 299.

danger; "for, instead of these swellings, the inflammation generally seizes on the brain." The secondary fever in this variety of the disease usually assumes an evident typhoid character.

The sequlæ of small-pox are very various, and often extremely distressing. The disease may give rise to slow and wasting fever, dropsy, chronic cutaneous affections, phagedenic ulcerations, necrosis, chronic ophthalmia, rheumatic pains, deafness, paralysis, struma, phthisis pulmonalis, mania, epilepsy, opacity of the cornea, staphyloma, dropsy of the eye and cataract. The small-pox is sometimes remarkably modified by the influence of the contagion of measles. Sydenham observes, that in 1670–71–72, the small-pox and measles prevailed at the same time in London, and that, during this period, the variolous affection assumed an extremely irregular and violent character. The eruption at first resembled measles or erysipelas; in its progress, small vesicles filled with a colorless fluid, appeared among the variolous pustules. The scabs formed on the pustules resembled concreted blood, and at last became almost black.

The influence of measles on the progress of small-pox when the two diseases meet in the same individual, is equally remarkable. It has been frequently noticed, that the supervention of measles during the early periods of small-pox, causes this latter disease to remain nearly stationary until the morbillous affection has run its course, when the small-pox resumes its progress and proceeds to its regular termination. Thus, if on the second day of the small-pox eruption, the measles make their appearance, the small-pox will remain stationary until the measles have gone off, after which the variolous disease will resume its dominion and go on in the usual way.

Post-mortem appearances.—The morbid appearances on dissection vary, of course, considerably, according to the stage of the disease during which death takes place, the violence of the particular symptoms, and the accidental affections with which it may be complicated. Sanguineous congestions in the brain and lungs are generally strongly manifested. Pustules are not unfrequently found in the larynx, trachea, and bronchia, as far as the third division. In the pharynx, too, the variolous pustules are sometimes pretty numerous, but they are very rarely found in the œsophagus. Traces of inflammation to a greater or less extent are almost invariably detected in the mucous membrane of the alimentary canal, and pustules of a variolous character are sometimes met with in the lower portion of the rectum. It is observed by Cazenave and Schedel, that they had never, in any of their dissections, found the pustules on the mucous membranes distended with pus. It does not appear from the observations of those who have paid particular attention to the post-mortem appearances in this disease, that the variolous pustules are ever found on the viscera or in the closed cavities of the body. Some late writers assert, that the internal surface of the aorta almost constantly presents a vividly red appearance, but the frequency of this appearance is denied by Cazenave and Schedel.

The pustules on the skin, when anatomically examined before they are distended with pus, or before they have lost their umbilical form, present the following appearances:

"1st. The cuticle preserves its natural thickness, and is easily detached, leaving exposed a whitish and smooth surface, elevated at the edges and depressed in the centre.

"2d. A small umbilicated disk of various thickness, formed by a whitish substance, having a certain consistency, and which appears to be a real exudation from the inflamed dermis. This substance occupies the place of the mucous coat, and at first appears to be continuous with the layer which is immediately under the epidermis, but afterwards is easily separated from it. This small body adheres to the dermis by its centre, where it is also much thinner, and often tears when it is attempted to be raised." If, when the cuticle is elevated by the pus, the pustule be examined with care, it will be found that the bottom of the pustule still

presents the same umbilicated form that it possessed before the cuticle was raised and distended by the purulent fluid.

"3d. Finally, below this small disk, the dermis is of a red color, and sometimes covered with purulent fluid."*

The true seat of the small-pox pustule appears to be in the reticular tissue, which lies between the cutis vera and the cuticle. In its early stage the pustule, when examined with a lens, exhibits a cellular structure, and from the sixth to the ninth day, a thin circular slough of the true skin may be observed at the bottom, which, on being finally cast off, gives rise to a depression or pit in the skin.

Cause.—Small-pox, so far as we know, can arise only from one cause—namely, a peculiar contagious substance, which occurs both under the form of a palpable matter and of an imperceptible effluvium, but of whose intimate nature and origin we are entirely ignorant. Observation has made us acquainted, however, with its obvious relations as a morbific agent, and with some of the influences, both vital and extraneous, which tend to modify its operation on the human system. It does not appear that age or sex exerts any controlling power over this contagion, and we know that even the fœtus in the womb is not exempt from its morbific effects. Nor does climate or seasons, so far as the sensible atmospheric conditions are concerned, appear to exercise any influence either in retarding or favoring its dissemination. One of the most remarkable and mysterious phenomena of this, as well as of other epidemic contagious diseases, is its recurrence at distant intervals in an epidemic form, depending, no doubt, on certain occult atmospheric constitutions peculiarly favorable to the operation of the variolous contagion. The disease occurs, indeed, also sporadically; but during certain periods, its contagion may thus here and there manifest its presence, without passing from individual to individual, and be speedily extinguished, like sparks thrown among incombustible materials. What these atmospheric conditions consist in, if in truth the phenomena in question depend on atmospheric modifications, we know not. Whatever may be the general cause to which these influences belong, it is probable that its effects are exerted rather upon the human constitution, by which its susceptibility to the operation of the variolous virus is either increased or diminished, than in modifying the activity of the contagious principle itself.

The susceptibility to the operation of the small-pox contagion varies much in different individuals, not only in relation to the liability of becoming affected by it, but also to the degree of violence which the disease, arising from the same source of contagion, assumes. Thus, some persons, (though indeed very few,) appear to be naturally insusceptible to the disease; others are affected, even by inoculation, with great difficulty; and among a number of individuals exposed to the same contagion, the disease will assume a confluent form in some; in others, it will be severe but distinct; in a third, mild and distinct; and in others, again, it will be very mild, and scarcely attended with any eruption. These diversities in the effects of the contagion must be ascribed to original idiosyncrasy, temperament, and to accidental modifications or conditions of the organization. One thing is well ascertained in relation to this point—namely, that whatever tends to reduce the general vigor and phlogistic habit of the system, tends also to lessen the violence of the variolous affection; and it is to this circumstance that we owe all the peculiar advantages which are derived from inoculation. The variolous contagion possesses the power of destroying the susceptibility of the system to its subsequent operation, so that a second attack of perfect small-pox in the same individual, though an occasional, is far from being a common occurrence. Instances of a second, and even a greater number of attacks in the same person, have indeed been frequently noticed; and when we take into account those incomplete cases which are termed *varioloid*, secondary attacks of the disease may be considered as very frequent.

* Cazenave, loc. cit.

Prognosis.—Small-pox varies exceedingly in relation to its violence and the degree of its dangerousness. The *distinct* and simple form is by no means a dangerous affection; whilst the *confluent* variety is always attended with great hazard to life. In the more violent cases of the disease, death sometimes takes place as early as the fifth or sixth day; but the greatest fatality occurs during the stages of suppuration and desiccation. The prognosis depends chiefly on the quantity of the eruption; the character of the pustules; the nature of the attending fever; and on the accidental morbid complications.

However regular the progress of the disease may be, the danger is always great when the pustules are very numerous, more especially when they are confluent. It would seem, from estimates that have been made in relation to the mortality from small-pox, that nearly three out of five instances die in the confluent variety.

The check which a very copious crop of pustules must necessarily give to the cutaneous exhalation, and more especially the great irritation caused by so extensive a surface of suppuration, and perhaps the absorption of the pus itself, are the principal causes of the fatal character of the confluent variety of the disease. In relation to the form and appearance of the pustules, it may be observed, that the more elevated they are, the more distinctly they are surrounded with red areolæ; and the more regularly they become filled with a thick yellowish pus, the more favorable is the prognosis. When, on the contrary, the pustules are flat or depressed, coherent, or congregated in clusters, warty, empty, or filled with a colorless watery fluid, it is a very unfavorable sign. It is a still worse indication when the pustules become filled with blood.* With regard to the character of the attending fever, the more decidedly phlogistic or typhoid it is, the more danger is there to be apprehended. A *moderately* active state of fever is favorable, but a tendency to a low grade of reaction is the reverse. Richter observes, that when the disease is complicated with prominent catarrhal symptoms; or with difficult dentition; or intestinal irritation from worms, much danger may be apprehended. In general, the prognosis is unfavorable when the disease occurs in old persons of enfeebled constitutions; in plethoric, robust, and vigorous adults; and in very young infants. Pregnancy, or the puerperal condition, also tends to increase the dangerousness of the disease. It has been observed, that the period of life most favorable to a mild and regular course of the disease, is between the third and tenth year of age. The age of puberty in *females*, is said to be a particularly dangerous period in relation to this complaint.† Convulsions just before the appearance of the eruption, are rarely attended with any serious consequences; but when they occur during the period of suppuration, the danger is always extremely great.

Suppression of the urine, or a very frequent desire to void it, is said to be a very unfavorable sign, when it occurs during the suppurative stage. It is also a particularly dangerous sign when the pustules, about the sixth or seventh day of the stage of suppuration, become collapsed, and the swelling of the face suddenly subsides, at the same time that the areolæ disappear, and the intermediate skin becomes pale and flaccid. The sudden recession of the eruption, soon after its appearance, is always very dangerous. Of course, the supervention of visceral inflammation, or of sudden violent congestions of blood in the brain and lungs, are occurrences of the most alarming character.

Treatment.—There is, perhaps, no disease in which false theory has led to such fatal consequences in practice as small-pox. During the general prevalence of the doctrine of morbid humors, it was supposed that the variolous matter was formed by a species of fermentation in the blood, and that the more perfectly this matter was separated and cast upon the skin, the greater would be the chance of recovery. Great efforts were accordingly made to assist nature in establishing as copious a crop of pustules as possible; and under this fatal delusion, all kinds

* Richter, loc. cit., p. 330. † Ibid.

of heating medicines and external warmth were diligently applied. When we reflect on the inevitable result of this practice, so long and so universally pursued, we see in it a frightful drawback on the amount of benefit conferred by the healing art in relation to this disease, although this amount must be regarded as immense, from the introduction of inoculation, and especially of vaccination. Among the moderns, Sydenham appears to have been the first who saw the fatal tendency of the heating or exciting plan of treatment in small-pox. He revived the cooling or antiphlogistic treatment of the Arabian physicians,* a mode of management which is now universally acknowledged as the only practice capable of mitigating the violence and dangerous character of the malady.

Instead, therefore, of supporting the excitement during the eruptive fever, that the eruption may be copious, we must endeavor to moderate the febrile reaction, that the pustules may be as few as possible. By an early attention to the fulfilment of this object, the disease will often pursue a mild and simple course, whilst, under the employment of exciting remedies, it would, in all probability, have assumed a confluent and highly dangerous character. It is upon the power which an antiphlogistic treatment exerts in moderating the violence of the disease, or of rendering the eruption scanty, that all the advantages of inoculation depend. When an individual is inoculated, the phlogistic state or tendency of his system is diminished by purgatives, simple and cooling diet, and, in plethoric subjects, by bleeding; in consequence of which, a less copious crop of pustules ensues, and the disease, in general, pursues a proportionately milder course.

Sydenham resorted to the lancet as the principal means for moderating the febrile excitement. There can be no doubt, indeed, that bleeding must often prove very beneficial; but it seems to be admitted on all hands, that it cannot be employed with great freedom, without considerable risk of mischief, unless the reaction be very violent or the general phlogistic condition great. "It is an observation universally applicable," says Dr. Philip, "that blood-letting is only to be recommended when the effects expected from it cannot be procured by other antiphlogistic remedies."

* The general plan of treatment laid down by Rhazes differs, in no essential point, from that which was recommended by Sydenham. For the purpose of diminishing the violence of the disease in those who are exposed to the small-pox contagion, Rhazes advises that "a vein be opened in those who are fourteen years old. To those who are younger, cupping-glasses must be applied, and their lodgings should be kept cool." The diet, he says, must "consist of yellow lentils, tarts of unripe fruits;" and their drink "should be water cooled with snow, or clear cold spring water, with which also their chamber may be sprinkled." They must frequently eat "acid pomegranates, and the inspissated juices of acid and astringent fruits." The patient must "go into cold water and swim in it, about noon. He must abstain from wine, and meats made by a mixture of flesh, onions, oil, butter, and cheese;" as well as from "mutton, beef, shell-fish, and high-seasoned things, and hot seeds; but, if his temperament be hot and dry, and apt to be inflamed, he must eat cooling and moist garden-herbs, purslain, mallows, beets, gourds, cucumbers, sorrel, and small pompions. All acid things are proper to cool the blood and check the ebullition, especially the water called *Al-ràib*, that is, the sour, bitter water, which swims upon butter-milk, exposed to the sun. When the variolous fever has supervened, care must be taken not to refrigerate too much, so as not to extinguish preternatural and natural heat together." Nevertheless, when, during the fever, "you observe great pain in the back, redness of the face and eyes, a violent headache, a full pulse, with a straitness of breath, a red and turbid urine, and such a heat of the body as a man feels who has been for some time in a hot bath, there is then all the reason in the world to take away blood, even till the patient faints away. But, if the symptoms do not run very high, although they are manifest, draw blood but sparingly. In order more perfectly to extinguish the feverish heat, let the patient drink water, made cold in snow, very plentifully; so that he may feel the coldness of it in his bowels. If still the heat return, and the belly be full of water, make him vomit it up, and then give it him again." During the eruption and suppuration, the patient "must be kept in a room *not very* cold; he should drink frequently, a little at a time, of *cold* water." "As to the furnaces and baths, they are both destructive, at this time, by overheating and weakening." When the eruption goes on slowly and with difficulty, the cooling and extinguishing remedies "must be absolutely forborne." The drinks "must be warm."(*a*)

(*a*) Rhazes, loc. cit.

Cathartics of the *milder kind* are always highly useful during the eruptive fever, in cases requiring a reduction of the general excitement. Very *active* purging—more especially in mild cases, or when the appearance of the eruption is at hand—is improper, as it may readily interfere with the regular progress of the eruption, by the centripetal direction it tends to give to the circulation. Throughout the whole course of the disease, however, mild laxatives may be beneficially employed. These observations have a reference to the *distinct* variety of the disease; for in the more violent or *confluent* form, we may derive advantage from *active* purging during the eruptive fever. Calomel is one of the best purgatives in small-pox. Its operation is sufficiently mild, and it would seem that it possesses peculiar powers in moderating the violence of the disease. (Mead, Boerhaave.) The neutral purgative salts also answer well during the eruptive fever.

Some have recommended emetics in the commencement of the disease; and where there are signs of vitiated secretions in the stomach, they may no doubt be useful when early administered. When given about the seventh day of the confluent variety, they are said to have no inconsiderable influence in moderating the secondary fever; but in general, they are most useful when given in the onset of the complaint. (Philip.)

Diaphoretics of the refrigerant kind will assist in moderating the eruptive fever. Nitre, with small doses of tart. antimony; the saline effervescing draught; spiritus mindereri; sweet spirits of nitre with *vin. antim.*, a solution of muriate of ammonia, &c., may be used for this purpose.

But the most grateful, and at the same time the most safe and valuable means for moderating the eruptive fever, and thereby lessening the number of pustules, is the *cooling regimen*. The free admission of cool air into the sick chamber during the eruptive fever, is in all cases, whether the disease be of the distinct or the confluent variety, of great importance; and it seldom, indeed, fails to mitigate the symptoms, in a greater or less degree, throughout the whole course of the disease. The patient should lie on a matress, with light and cool coverings; and his drinks should consist of cool, acidulated beverages. The temperature of the sick chamber must of course be regulated according to the season of the year, and the degree of febrile excitement present. In warm weather, the external air must be more freely admitted than in cold seasons; and more reduction of temperature is necessary when the excitement runs high than where it is of a low or feeble kind. There is but one form of small-pox in which the cooling regimen is said to be objectionable, namely, the *crystalline*. The air surrounding the patient ought to be kept uniformly at a temperature just low enough to give the sensation of *moderate* coolness. If the fever continues after the eruption is completed in the distinct variety of the disease, it will still be proper to go on with the cooling treatment, together with mild laxatives, diaphoretics, and antimonials.

It has already been stated that in the confluent variety of the disease, the fever often assumes a low typhoid character; and in instances of this kind, the diet, instead of being cooling and diluent, should be more or less exciting and supporting. Where the general excitement is low and sinking, it will even be necessary to resort to the more active stimulating and tonic remedies, such as wine, carbonate of ammonia, camphor, musk, &c. *Camphor* is a particularly valuable article in such cases where delirium attends. The Peruvian bark has also been very favorably mentioned as a remedy in such cases; and where the process of suppuration goes on tardily and imperfectly from want of general energy, large doses of this article or of quinine, are indeed highly useful. Under similar circumstances—that is, where the pustules are slow in filling up, or the fluid in them remains watery—opium, in combination with camphor, has been found a very useful remedy. (Philip.)

When, during the progress of the disease, internal visceral inflammations supervene, local abstractions of blood from the external region of the affected part,

blisters, scarifications, and where the general arterial action is not too low, bleeding from the arm must be resorted to. In instances attended with cerebral inflammation, much benefit may often be derived from flannel wrung out of hot water applied to the feet, at the same time that pounded ice is applied to the top of the head. The occurrence of profuse diarrhœa during the secondary fever of confluent small-pox, must be counteracted by astringent and absorbent remedies. From eight to ten grains of prepared chalk, with an equal portion of *pulv. ipecac. compositus*, will generally answer our purpose in such cases. It is not, however, proper to arrest the discharge wholly in such cases. It should be *moderated* only. When violent and continued vomiting occurs, we may resort to opium and camphor. One grain of the former with two of the latter may be given every hour or two, according to the violence of the symptoms.

To prevent the pustules from affecting the globe of the eye, and injuring the sight, pieces of folded linen wet with cold water should be kept applied to the eyes during the eruptive fever. The application of camphorated spirits has been used for this purpose; but cold water is more agreeable, and also most effectual in this respect.

The use of *lunar caustic*, as a local application to the pustules, has of late been recommended and successfully practiced in France, for the purpose of lessening the number of pustules, and by so doing, rendering the disease milder and less dangerous. In 1825, M. Velpeau read a memoir before the Royal Academy of Medicine, of Paris, tending to prove that if the pustules of small-pox are cauterized during the first two days with lunar caustic, their progress will be arrested. This practice was fully tested some time after, by Dr. Meyreux. According to his report, it appears, that if the variolous pustules are opened with a lancet, and touched with a pointed piece of lunar caustic, *on the first or second day* of their appearance, they will be wholly destroyed, and leave no marks; but on the *third day* it will be quite useless.*

When soon after the eruption has appeared, it is again driven in, (an occurrence which may proceed from the sudden application of cold and damp air, or from the supervention of excessive purging or vomiting, or other rapidly exhausting circumstances, such as sudden terror, or grief, or syncope, or excessive abstractions of blood,) immediate recourse should be had to means that have a tendency to determine the circulation to the surface, such as camphor and opium, carbonate of ammonia, warm bathing, sinapisms to the extremities, and gentle frictions with dry flannel or the flesh-brush. Where the retrocession arises from cold, an emetic, with stimulating frictions, will often promptly recall the eruption to the surface.

Sect. II.—*Vaccina.—Cow-Pox.*

Long before the time of Jenner, it was known in some of the dairy counties of England that cows are subject to a pustular disease, which, when communicated to the hands of the milkers, renders them insusceptible of the variolous affection. Although this fact was noticed, and even artificial inoculation with the vaccine matter successfully practiced in an instance which was formally communicated to Sir George Baker, yet the whole credit of introducing the cow-pox into general notice is due to Dr. Jenner. The benefits which this important discovery has conferred upon mankind are incalculable; and it is not a little

* [The practice of covering the integuments of the face and its appendages with masks, or dark-colored plasters, so as to keep off the influence of the light, which has been attributed to Dr. Luzenburg, of New Orleans, does not appear to have become established among the profession. I have certainly, however, satisfied myself that some advantage can be derived from this plan in the way of diminishing the size and the depth of the scars. The fact that the covered parts of the body are never disfigured by small-pox pits, would render any reasoning practitioner disposed to make the trial.—Mc]

consoling to reflect, that, as the hand of Providence has in this instance provided a salutary check to one of the most fatal maladies with which man has been afflicted, there may yet be brought to light, at some future period, other antidotal or prophylactic powers against the ravages of diseases, which, in the present state of our knowledge, are in a great degree uncontrollable.

Although Jenner had made successful experiments with the vaccine matter as early as the year 1796, he did not publish the results of his investigations until two years after. From that period on, the knowledge of the benefits of vaccination spread rapidly throughout Europe and this country; and there is now no civilized people on earth amongst whom its blessings have not been largely experienced and gratefully acknowledged.

Various opinions have been expressed with regard to the origin of the vaccine disease. Dr. Jenner, at first, ascribed its source to the *grease* of horses; and this opinion is indeed supported by very strong, though perhaps not absolutely satisfactory evidence. It is asserted by some, for instance, that a pustular disease, in every respect similar to the vaccine infection, may be produced both in the human subject and in cows by inoculation with the matter of *grease.* Friese, Loy, and particularly Sacco,* affirm that they have succeeded fully with this experiment; and Mr. Ring states, that "he succeeded in producing the disease artificially in a cow by removing a scab from the teat, and applying the recent blackish matter of grease to the surface of the sore." The same author has published a letter from Mr. Rankin, relating a case of pustular disease strongly resembling the casual cow-pox, accidentally produced on the face and hands of a farmer, by the fluid oozing from the heels of a horse laboring under grease. It appears, moreover, that persons who have been affected with the pustular disease produced by the matter of grease, are insusceptible of the contagion of small-pox. Dr. Jenner relates a case of this kind. Sheep, also, are subject to a pustular affection about the head and mouth, which is said to be communicable to the human subject, in whom it produces a disease very similar to that which is caused by the matter of grease, and which, it is asserted by Sacco and Richter, renders the human system incapable of receiving the variolous infection. It has also been supposed that the vaccine disease is essentially the same as small-pox, and that these two affections derive their origin from the same ultimate source. It is conjectured that the small-pox was at first derived from the cow-pox or grease of horses in Arabia, and that in the course of time it gradually degenerated, by passing successively through the human system, until it acquired the known virulence and activity of variolous contagion. In confirmation of this supposition it is asserted that cases have occurred where the variolous matter, inserted into the udder of cows, produce in them a pustular affection not to be distinguished from the cow-pox. Richter makes this observation on the authority of Gassner.† It is also asserted by Dr. Lisa, that sheep are effectually protected from the disease called sheep-pox, by inoculating them with variolous matter. Sheep inoculated in this way are said to become affected with but one pustule at the point where the variolous matter is inserted.‡ The original identity of the variolous and vaccine matter has recently been incontestably demonstrated, if we are to place any reliance on the correctness and veracity of Dr. Ozamann, of Lyons.§ In a paper which was read at the French Academy of Medicine, in July 1830, it is asserted, on the authority of Dr. Ozamann, that the matter of small-pox, if mixed with fresh cow's milk,

* Neue Entdeckungen uber die Kuhpocken, die Mauke u. Schaafpocken. Translated from the Italian by W. Sprengel, 1813.

† Specielle Thérapie.

‡ Mediz. Chirurg. Zeit. 1809, No. xliii. Salzburgh.

§ [In several recent experiments made by wrapping clothing taken from a small-pox patient around a young heifer, the animal has been affected with the constitutional disease, and the matter taken from the pustules on its udder, has afterwards communicated the vaccine to human subjects.—Mc]

produces, when inserted by inoculation, an eruption similar in all respects to that of the vaccine virus, and that inoculation with this matter will answer fully for the production of the usual vaccine disease.*

Symptoms and progress of the disease.—When the vaccine disease is communicated to the human subject, it proceeds through its course in the following manner. Towards the close of the second day after the insertion of the virus, a small point of inflammation may usually be seen where the puncture was made. On the third day this point is more distinct; on the fourth it generally assumes the character of a small pimple encircled by a very faint and narrow inflamed basis or areola. This pimple now gradually enlarges, and on the fifth day begins to assume a perfectly regular and circumscribed form, with a flattened surface, and a small depression at the centre, somewhat darker than the rest of its surface—an appearance which it preserves throughout its whole subsequent course. About this period, also, the *vaccine* pock changes from the pimple to a vesicle, containing a limpid fluid. From the fifth to the ninth day, the pock continues to enlarge in its circumference, but not perceptibly in elevation, so that its flattened appearance becomes more and more conspicuous. About the ninth day the pustule is at its full state of maturity, and it is at this period that the constitutional symptoms (if any occur) begin to show themselves. In some instances the glands of the axilla become painful and swelled, and a state of general languor, drowsiness, with slight creeping chills and alternating flushes of heat occur. Frequently, however, no constitutional symptoms whatever supervene. About the eighth day the slight circle of inflammation which surrounds the pustule in its early period, begins to increase, until by the tenth or eleventh day it forms a broad and beautiful areola around the pock. By the eleventh day, the centre of the pustule, which is slightly depressed, begins to assume a darker appearance, and this darkness gradually extends towards the circumference, so that by the fourteenth day the surface of the pustule is converted into a brown scab. This scab becomes darker and darker until it acquires a deep mahogany appearance. In a few days more the scab begins to separate at the circumference, still, however, retaining its attachment at the centre, and eventually falls off, generally between the third and fourth week from the time of vaccination, leaving a slight depression in the skin.

The areola is usually most perfect about the seventh day after the commencement of the pustule, or on the eleventh day after the vaccination, and is attended with some degree of tumefaction and hardness.

The foregoing description answers to the regular progress of the disease, but various deviations are occasionally observed in relation to some of the particulars just described. In some cases, for instance, the pustule furnishes well-formed vaccine lymph as early as the fourth day of its progress. Much diversity occurs also with regard to the time when the disease first manifests itself after the vaccination is practised; for, in some instances, eight or nine days, and occasionally even a longer period, intervenes between the vaccination and the commencement of the pustule.

It often happens that on the day succeeding the vaccination, considerable inflammation and elevation of the cuticle take place at the point where the puncture was made. When this is observed, we may confidently predict the failure of the operation. This inflammation continues for a day or two, and then subsides quickly without leaving any local affection.

It seldom happens that more than the pustule which rises at the point of vaccination appears on the body. Occasionally one or more smaller pustules appear in the vicinity of the primary one; and instances have occurred in which a pretty numerous crop of pustules came out on different parts of the body. In the report of the central vaccine committee of France, for 1818–19, it is stated that no inconsiderable number of cases occurred, in which a spontaneous erup-

* Rev. Encyclop., Août 1830.

tion of many pustules appeared after vaccination, and that the matter taken from these pustules produced the disease as perfectly in others, as that taken from the primary pustules.

It is a curious and interesting fact, that the vaccine disease occasionally counteracts or removes other affections of a chronic character—particularly chronic cutaneous diseases. In the report of the French committee just referred to, it is stated that "thirteen medical men have seen examples of vaccination proving the means of curing other eruptions, more especially the *crusta lactea;*" and fully authenticated instances are recorded of the removal of scrofulous swellings, ophthalmia, and hooping-cough, by vaccination. Of the power of the vaccine disease to moderate and abridge the course of hooping-cough, I have myself witnessed several examples.

Another very important circumstance in relation to the mutual influence of the vaccine disease and other cutaneous affections, is the well-established fact, that important varieties and modifications of the vaccine pustule are caused by herpetic and other eruptive states of the skin. Dr. Jenner, in a paper published in the sixty-sixth number of the London Medical and Physical Journal, points out the fact, that a single serous blotch existing upon the skin during the progress of the vaccine vesicle may occasion such irregularity and deviation from the genuine course and character of the disease, that it cannot be depended on as a prophylactic against the variolous infection. In a letter addressed by him to the medical profession generally, dated April, 1821, he observes: "I have found abrasions of the cuticle to produce the same effect—such, for example, as we find in the nurseries of the opulent, as well as in the cottages of the poor, behind the ears and upon many other parts where the cuticle is tender. We find irregularity in the vaccine vesicle, if the skin is beset with herpetic blotches, or even simple serous oozings from an abraded cuticle. A speck behind the ear, which might be covered with a split pea, is capable of disordering the progress of the vaccine vesicle."

Diagnosis.—An attention to the following circumstances will enable us to distinguish the genuine from the spurious disease:

1. In the genuine disease little or no inflammation, except what occasionally arises from the mere puncture of the lancet, can be perceived until about the third day, and sometimes not until several days later. In the *spurious* affection, on the contrary, considerable inflammation and elevation of the skin at the punctured point, generally appear as early as the second day.

2. In genuine vaccina, the small point of inflammation which appears three or more days after the matter is inserted, increases gradually until about the seventh day after its first appearance, at which time it is in its full state of perfection. In the *spurious* disease, the pustule arrives at maturity and finishes its course in a much shorter time. By the third or fifth day from the first appearance of the inflammation, scabbing commences.

3. In genuine cow-pox, a beautiful circular and circumscribed areola almost always surrounds the pustule, and this areolar efflorescence is usually in its perfect state about the seventh or eighth day. In spurious affections of this kind, an *irregular* superficial inflammation occurs on the first or second day after the appearance of the pustule; and the pustule itself appears more like a common festering sore produced by a thorn, than a pustule excited by the vaccine virus.

4. The genuine pustule is perfectly circumscribed, with a flattened surface and a slightly depressed centre, and contains a colorless transparent fluid. The spurious pock is more elevated, not depressed in the centre, is irregular or angulated in its circumference, and contains an opaque purulent matter.

According to Dr. Willan, the vaccine vesicle is to be regarded as imperfect when—1, though perfect in its form and appearances, it is without an areola on the ninth or tenth day; 2, when the vesicle is very small, pearl-colored, flattened, with a hard inflamed, and slightly elevated base, a dark red areola, and without rounded or prominent margin; 3, when the vesicle is small, pointed, with a

very extensive pale red areola. The spurious disease may be produced—1, by the genuine vaccine virus acting on a system affected with some *cutaneous disease;* 2, by vaccinating with matter which has undergone more or less decomposition by long keeping; 3, by vaccinating with matter taken from a spurious pustule; and 4, by the genuine vaccine matter being controlled, or in some way diverted from its regular operation by idiosyncrasy, or a depraved condition of the system.

Some difference of opinion has been expressed with regard to the period at which the vaccine lymph should be taken from the pustule, in order to obtain it in its most perfect and active state. Dr. Jenner advises that the virus be taken a short time before the areola is completely formed, and consequently soon after the lymph is secreted in the pustule, or about the sixth or seventh day. To obtain the virus, the edges of the pustule must be gently punctured with a lancet in several parts. The lymph will then ooze out, and may be collected and preserved between two glasses. Of late years, however, it has been more customary to vaccinate from the scab. For this purpose, no scab, except from the most perfect pustule, should be taken. It should be smooth, of a dark brown or mahogany color, and rather brittle than tenacious in its texture. When used, the margin, which is of a lighter color, should be removed with a knife, and a portion of the remaining dark, hard, internal part reduced to powder on a glass; and moistened or dissolved with a small portion of cold water. In taking either matter or the scab for vaccination, it is of great consequence to be well assured that the person from whom it is taken was healthy, and particularly that he was not affected with any cutaneous disorder. A want of due care on this point may give rise to extremely unpleasant and even dangerous consequences. I have several times known obstinate and alarming cutaneous affections communicated to children by vaccinating with matter taken from unhealthy subjects. It is a common belief among persons out of the profession, that the vaccine disease is apt to give rise to disagreeable eruptive affections, and such occurrences are in fact not very unfrequent. Accidents of this kind probably depend most commonly on the matter having been taken from persons affected with some cutaneous disorder, or with a general cachectic or depraved habit of body. It seems, nevertheless, that the vaccine disease, communicated by the purest lymph, will occasionally excite pustular and other external inflammatory affections in persons of a strumous or scorbutic habit.

General remedial treatment is seldom required during the disease. When febrile excitement attends, which is rarely the case, a reduction of the diet, with some mild aperient medicine, diluent drinks, with small doses of spiritus mindereri, or sweet spirits of nitre, should be ordered. In some instances, the inflammation and swelling around the pustule become so great as to demand particular attention. This is most apt to happen when the vesicle is irritated by scratching or rubbing it, at the time when the areola is about making its appearance, more especially when at the same time some other cause supervenes calculated to produce general febrile irritation. To moderate the violence of the pain and inflammation, a weak solution of sugar of lead, or cold water, or poultices made of lead-water, may be applied to the inflamed part, and laxatives, with some of the milder refrigerant diaphoretics, given internally.

With regard to the prophylactic or protecting powers of the vaccine disease against the small-pox, the opinion of the profession has undergone considerable change within the last ten years. It seems to be pretty generally admitted at present, that the vaccine affection, even in its most perfect state, does not so completely protect the system from the variolous infection, as was formerly so confidently believed. From whatever cause it may proceed, it is beyond a doubt, that the failures of vaccination in preventing secondary small-pox, "have been steadily and progressively on the increase for some years past." "This circumstance," says Dr. Gregory, "cannot be met by a reference to the fact, that small-pox once gone through, does not always protect the subject from a second

attack." Cases of small-pox after vaccination are far more frequent than second attacks of small-pox. Dr. Gregory has given a table of the total number of admissions into the small-pox hospital in ten different years, and from this statement it appears that in the year 1810, the proportion of cases of small-pox after vaccination, to the whole number of admissions, was as 1 to 30; while in 1815, it was as 1 to 17; in 1819, as 1 to 6; in 1821, as 1 to 4; and during the year 1823, as 1 to $3\frac{1}{2}$.

Notwithstanding these facts, vaccination must still be regarded as an invaluable means for lessening the amount of mortality, and as deserving all confidence as a protecting power against small-pox. For although it may not, in many cases, render the system wholly insusceptible to the variolous infection, yet the number of instances in which it affords *perfect* immunity from small-pox, is beyond all comparison greater than that in which it fails to afford complete protection; and even where it does not entirely subdue the susceptibility to the small-pox, it almost invariably lessens it to such a degree, as to render this latter disease so mild and simple, as in most instances scarcely to require any remedial attention.

It is believed by many, that the constitutional influence of the vaccine disease gradually diminishes, until the system, though at first protected by it against the variolous contagion, regains in the course of years its original susceptibility to small-pox; and this opinion is in fact strongly countenanced by the results of experience. Some have supposed that the vaccine impression continues only about ten years; others have limited its duration to seven years; and Dr. Leo Woolf, in an interesting memoir on this subject, has adduced facts and reasonings to show that this influence is effaced by the constitutional changes which occur at the age of puberty. That the prophylactic influence of the disease suffers progressive diminution until it becomes, perhaps, wholly effaced, I am myself much inclined to believe, from facts which have come under my own observation; but the attempt to set any precise limits within which the gradual subsidence of this influence is accomplished, must necessarily be attended with great uncertainty; since it may well be supposed, that idiosyncrasy, modes of living, and accidental as well as constitutional predispositions, and, perhaps, habitual extraneous influences, may give rise to much variation in this respect. From the general fact (if in truth it be so) that the constitutional impression of vaccination wears out in the progress of time, many physicians have of late recommended re-vaccination, so as to renew its impression on the system; and this practice may be deemed a reasonable, and certainly not a detrimental, precautionary measure.

Various modes have been proposed to test the sufficiency of a recent vaccination, as a protective power against the small-pox infection. For this purpose, some have advised re-vaccination five or six days after the first operation. If the disease is perfect in its influence, a vesicle will rise at the point of the second vaccination, but it will differ in its progress from the first, by becoming surrounded with a complete areola, as early as the second or third day of its appearance, so that the areolæ of the first and second vesicles commence nearly at the same time, and progress *pari passu*. Others have proposed to re-vaccinate about the end of twelve days from the first vaccination. If the first has been perfect, the second vaccination will either not succeed at all, or give rise only to a spurious or irregular pock. The most certain test, however, is inoculation with small-pox matter—a test from which we derive at once our reliance in the general protecting powers of the disease, and in the genuineness of the particular instance.

A distinct, circular, radiated, punctulated, and not very large cicatrix, may be regarded as a pretty certain indication that the vaccine affection was perfect. When, on the other hand, the scar "is large, and bears the marks of having been formed by high local inflammation, and wants the distinctive characters just mentioned," there is much reason to apprehend that the system has not been secured against secondary variolous disease.

Sect. III.—*Modified Small-pox.*

1. *Varioloid Affections.*

Soon after the general introductiou of vaccination, exanthematous affections, closely resembling small-pox, were occasionally observed in individuals who had previously undergone the vaccine disease in a regular and satisfactory manner. These *varioloid* affections became more and more common; and within the last fifteen years, they have appeared in various countries in frequent and extensive epidemics. In the earlier periods of vaccination, these eruptions were generally regarded as *chicken-pox*, but subsequent inquiries led to the opinion with many, that they are the product of a *peculiar* contagion; while others were led to ascribe them to the variolous contagion acting on systems but partially protected against small-pox by previous vacciuation; and this appears now to be the general opinion.

From the earliest times of small-pox of which we have any records this disease has, indeed, been frequently noticed under various modifications, as remarkable and apparently as distinct as the form we now call varioloid. We find various irregular forms of the disease described by the early writers under the names of the vesicular, pustular, and spurious small-pox; swine-pox, sheep-pox, stone-pox, horn-pox, &c., all of which were regarded as having but one origin, namely, variolous contagion. After small-pox inoculation was introduced, spurious variola was by no means uncommon; and it has always been observed that genuine and spurious small-pox have in the same epidemics come in and gone out together, in the same manner as they have uniformly been observed to do since vaccination has been introduced.

It appears, therefore, that various circumstances, either of a constitutional or accidental character, may modify small-pox in a variety of ways; and as such modifications were abundantly observed, before vaccination was practiced, we need not be surprised that they should be so frequent now, when a new and very extensive modifying cause exists in the influence of the vaccine disease. That the present varioloid disease is in fact nothing but a modified form of small-pox, may be regarded as established by an abundance of direct and conclusive evidence. In the course of my practice, I have met with several instances of varioloid disease, which were unequivocally of variolous origin. Within the present year I produced a well-characterized varioloid eruption by inoculating with small-pox matter a person who had been satisfactorily vaccinated about ten years before. It is unnecessary, however, to adduce any further evidence on this point. The works of several late writers abound in observations illustrative of the variolous origin of this disease. Dr. Thompson, particularly, has placed this view of the subject in a strong light; and to his work on the history of small-pox the reader is referred for much interesting, and I think conclusive evidence on this point.

By viewing the subject in this light, a great deal of that perplexity and confusion which have existed in relation to those anomalous pustular and vesicular affections which usually precede or accompany small-pox epidemics, are entirely removed. We perceive that the same morbific agent, modified in its effects on the human system by various causes, lies at the root of all this family of eruptive complaints. They are all, it would appear, the offspring of the same parent, and though diverse in their appearance, they possess enough of family likeness to enable an accurate observer to refer them to a common origin.

> ———————Facies non omnibus una,
> Nec diversa tamen, qualem decet esse sororum.

As the degree of modifying influence of the different causes which are capable of producing variations in the effects of variolous contagion must be extremely

various, it is obvious that the irregular or *varioloid* diseases which result from the combined agency of the modifying causes, and the virus of small-pox, must be correspondingly diverse; and we find, indeed, so great a diversity in this respect, that no description can be given of them which can have more than a general application. I confine myself, at present, to the consideration of that form of varioloid disease which results from the action of small-pox virus on a system that has previously undergone the vaccine influence.

In many instances, as has already been stated, vaccination protects the system *completely* against infection from small-pox contagion. In other cases, the system is either one partially freed from its aptitude to variolous infection, or its susceptibility, though for a time entirely subdued by the vaccine influence, gradually returns and regains a greater or less degree of intensity. The disease which results from the action of small-pox contagion on a system thus partially deprived of its variolous susceptibility, and which has of late years been so common, deviates more or less conspicuously from regular small-pox, and is, in a great measure, divested of the dangerous character of the latter affection.

Symptoms.—In a large proportion of cases of *varioloid*, the eruptive fever is so mild and conspicuous, as scarcely to attract any attention. In some cases, however, the fever is as violent as in the severer instances of small-pox. In point of duration, too, it is very irregular, terminating sometimes as early as the second day, and at others not until the fifth day from its commencement. In all instances, whether mild or violent in its symptoms, the eruptive fever ceases suddenly on the appearance of the eruption; so that patients who were confined to bed during the first three or four days, are generally up and about after the eruption has come out. In many cases a transient uniform efflorescence precedes the appearance of the eruption; and a rash resembling measles, also, is not an unfrequent precursor of the varioloid eruption. The varioloid exantheme almost always appears at first in the form of small papulæ, many of which dry off without becoming either vesicular or pustular. Frequently, however, these small, firm, red papulæ are converted into vesicles containing a watery limpid fluid, in the course of the first, and sometimes not until the second day. About the third or fourth day these vesicles usually burst, or wither without assuming a pustular character, the fluid in them acquiring a whey-like appearance. In many instances, the vesicles are surrounded with a small and faint areola. "This variety," says Dr. Thompson, "in the mildness of the eruptive fever, the strictly vesicular character, short duration, and mode of disappearance of the eruption, corresponded [in the epidemic he describes] so exactly with the descriptions usually given of the mildest varieties of *chicken-pox*, as not to have been distinguishable from that disease." In many cases these vesicles become filled with a puruloid fluid, are slightly depressed in the centre, and by the third or fourth day, changed into thin, dark scabs, which separate and fall off usually about the sixth or seventh day after the appearance of the eruption. Occasionally the scabs do not separate until the tenth or even the twelfth day. Sometimes the vesicles remain distended with a colorless serum for four or five days, and then become pustular, containing a pus-like fluid, in which state they usually remain a few days longer before desiccation or scabbing commences. In most cases of varioloid disease after vaccination, papular, vesicular, and pustular eruptions are interspersed through each other at the same time. Not unfrequently the disease assumes so nearly the appearance and character of distinct small-pox, that it is difficult to decide during the first five or six days, whether it should be regarded as a modified or regular variolous affection; and cases sometimes occur, in which the varioloid eruption is so abundant as to resemble confluent, rather than distinct small-pox. Very generally, however, the smallness of the pustules, the whey-like fluid which they contain, and particularly the early period at which they begin to dry and scab, will enable us to distinguish such cases from genuine small-pox. Dr. Thompson observes, that the areola and its pustule sometimes exhibit a remarkable resemblance to the areola and vesicle of the cow-pox—a

resemblance which betrays the mixed variolous and vaccine character of the disease.

Varioloid pustules very rarely leave any depressions in the skin. When the scabs remain adhering a long time, they occasionally leave slight pits; but much more commonly warty or fungoid elevations remain.

From the foregoing account, we perceive how extremely various this affection is both in its general and local phenomena. We see that in some instances it exhibits a striking resemblance to chicken-pox, in others it approaches very near to genuine small-pox, and in some instances it exhibits no small degree of resemblance to the vaccine pustule. Notwithstanding this extreme irregularity of modified small-pox, the following circumstances may be stated as its most common and characteristic features.

1. The eruption appears in successive clusters, occurring at uncertain periods between the second and fifth day.

2. The eruption seldom, if ever, enters into complete suppuration as does the small-pox.

3. The eruption is not attended with fever, except in very violent cases.

4. Desiccation or scabbing invariably occurs much earlier than in regular small-pox—commencing generally as early as the fifth or sixth day—and the scabs usually separate by the eighth or ninth day, leaving red disks or tuberculous elevations instead of depressions.

That the system should, in many cases, still remain liable to the morbific effects of the small-pox contagion, after the process of vaccination has been undergone, is by no means surprising, when we reflect how often second attacks of genuine small-pox have been known to occur. The greater frequency of a second infection by variolous contagion in those who have suffered vaccination, than in persons who have already had small-pox, may be ascribed, in part at least, to some imperfection or disturbance of the vaccine affection, by which its prophylactic power is more or less weakened or destroyed. Dr. Jenner believed, that in all cases where small-pox occurs after vaccination, it is owing to the vaccine vesicle having been disturbed or rendered imperfect by one or more of the following circumstances, viz: 1, pre-occupation of the skin by some chronic cutaneous affection; 2, the use of spurious vaccine matter; 3, depriving the vaccine vesicle incautiously of its lymph, or otherwise injuring or irritating it by external violence, so as to give rise to common phlegmonous inflammation.

Without doubt, however, modified small-pox, or a second variolous infection resulting in a spurious or modified form of the disease, may and often does occur after vaccination apparently the most complete and satisfactory. When we see small-pox occurring in the same individual a second time, even after a most severe attack of the disease, we cannot hesitate to believe that the same may happen after perfect vaccination, for it is not reasonable to presume that vaccination can be a more certain preventive of the small-pox infection than a severe attack of the small-pox itself. Indeed, facts illustrative of this truth have been abundantly recorded within the last ten years; and it may now be regarded as established, that vaccination does not in all instances afford immunity from the partial influence of the small-pox contagion. It may be no less true, that a great majority of cases of modified small-pox after vaccination, depends on some accidental imperfection in the vaccine disease, either from constitutional idiosyncrasy, or from the causes just mentioned. It would seem from some observations of Dr. Gregory, that the aptitude to variolous infection, after vaccination, prevails in an especial degree in some families. The same writer infers from facts which have come before him, that modified small-pox, subsequent to vaccination, is most apt to occur in persons between the ages of fifteen and twenty-one. This corresponds with the opinion mentioned before, that the vaccine impression is probably weakened, or partially obliterated, during that general constitutional change which takes place at the age of puberty. My own observations, though limited, lead me to the same conclusion expressed by Dr. Gregory, with regard

to the age at which the present disease is most apt to occur. By far the greater number of cases of modified small-pox that I have yet seen, were in young people between the ages of fifteen and twenty-one.

Modified or spurious small-pox, as has already been intimated, is not, however, confined to those who have been subject to the vaccine influence. It occurs also in persons who have had small-pox, as well as in those who have never had either this or the vaccine disease. This fact has been adduced in evidence, that the *varioloid* disease arises from a peculiar contagion radically distinct from that which produces small-pox. It is contended, that if this malady were not a peculiar or specific affection, it could not reproduce itself in its characteristic form in persons who had not undergone the modifying influence of small-pox, or of the vaccine disease. In reply to this argument against the identity of these affections, it may be stated, that, on the presumption of their common origin, the varioloid eruption is an *imperfect* result of the variolous contagion; and it is therefore reasonable to infer that the virus of this imperfect form of the disease is also modified, or incapable of producing the genuine affection, unless an extreme degree of susceptibility to the disease exists. That the varioloid disease does, however, sometimes produce genuine small-pox in the unprotected, the authority of Thompson and others does not permit us to doubt; and I have myself seen at least two striking examples of this kind.

As to the production of varioloid affections by the small-pox contagion in those who have already had small-pox, there does not appear to exist any difficulty in accounting for it satisfactorily. We know that an attack of small-pox does not always obliterate the constitutional predisposition to the variolous contagion. Even after the system has passed through the most perfect form of the disease, a second attack will in some instances occur. Now, between that state of the system produced by small-pox, which affords perfect immunity from a second infection, and that state in which the susceptibility to a subsequent attack is undiminished, a vast variety of grades of susceptibility must, we may reasonably presume, occur, according to individual idiosyncrasy, temperament, accidental concomitant influences, and perhaps the activity of the variolous contagion. If, then, after an attack of small-pox, the predisposition to this disease is not entirely, but only *partially* destroyed, ought we not to look for an imperfectly developed form of the disease, should a second infection take place? It is in this way, we believe, that varioloid, or varicellous eruptions occur in persons who have once undergone small-pox. As to the occurrence of varioloid affections in those who have never had either small-pox or the vaccine disease, it may be observed, that the degrees of natural susceptibility to the variolous contagion, are almost infinite in variety in different individuals. We see in the same family, into which this contagion is introduced, one individual affected so slightly as scarcely to require attention; another perhaps only indisposed with variolous fever, without any eruption; a third one seized with a pretty severe attack of the distinct small-pox; and a fourth, affected with the most aggravated variety of the confluent form of the disease. We may presume, therefore, that where the small-pox contagion acts on a system which is either naturally or accidentally indisposed to the full influence of its powers, it will produce either an extremely mild variolous eruption or an irregular or modified one—in other words, a varioloid or varicellous affection.

From these and other considerations, I am induced, in common with many others, to regard varioloid as a variety of spurious or modified small-pox, or at least as being referable, for its ultimate source, to the same contagion which produces this disease.

2. *Varicella.*

As early as the time of Rhazes, exanthematous affections were noticed, which, though they did not appear to protect the system against the small-pox, bore a

very strong resemblance to this disease. These varioloid eruptions were described by Vidus under the name of *crystalli;* and Sennertus observes, that there are varieties of small-pox which, instead of becoming filled with pus, are distended with a watery limpid fluid, *which dries off in a few days.* Riverius also speaks of these varioloid eruptions as common in his time; and we find them mentioned by the writers of that period under various denominations—as bastard-pox, spurious-pox, lymphatic-pox. Sydenham speaks of them as a spurious variety of small-pox; and Sauvages has given a description of them under the name of *variola lymphatica.*

Up to the time of Morton, who introduced the term chicken-pox, the general opinion among the physicians was, that *varicella* is an imperfect variety of small-pox. There were some, however, even at this period, who entertained a different opinion, regarding the disease as a peculiar or radically distinct exanthematous affection. In 1767, Heberden published a memoir,* in which he endeavored to show that varicella is the result of a peculiar contagion, totally distinct from that which gives rise to small-pox. This soon became the prevailing opinion on this subject, and continued to be so until its correctness was again called in question by Dr. Thompson† and other recent writers.

The principal arguments that have been alleged against the common origin of these affections are:

1. The occurrence of epidemic small-pox without varicella; and the occasional prevalence of varicella without the occurrence of small-pox. So far, however, as my inquiries extend, every epidemic small-pox that has been particularly described, has been preceded, accompanied, or immediately followed by anomalous or varioloid affections, bearing the characteristic marks of varicella. Granting, however, that epidemic small-pox may have existed without the concomitant appearance of varicella, it does not follow that these affections are radically distinct. It is quite possible that, from the influence of certain atmospheric constitutions, the human system generally may at one time be so susceptible to the action of the variolous contagion, that nothing but the genuine and regular form of the disease can be developed—or so insusceptible as to enable this contagion to produce only a spurious or varicellous disease. From this or some other occult causes, the small-pox itself assumes the most dissimilar characters. Some epidemics are mild; others severe; and others malignant to a great degree; sometimes the pustules become filled with bloody matter, and at others they are "*crystalline.*" What reason, then, is there to doubt that the contagion may at times be so feeble, or the human system so indisposed to its influence, as to admit only of the production of a mild vesicular disease.

2. Varicella is more common now than before vaccination was introduced, when small-pox was more prevalent. This, however, only shows that since vaccination is practised, there are more systems insusceptible to the full effects of the variolous contagion than before this epoch, and argues, therefore, in favor of their identity.

3. Varicella occurs equally in those who have had small-pox, in those who have been vaccinated, and in those who have never had either of these affections. To this argument we may reply, that it is generally admitted, that varicella occurs much more frequently in those who have had small-pox, or the vaccine disease, than in the unprotected. Drs. Bryce and Abercrombie saw but three cases in which varicella took place in persons who had not either of the former affections.

4. Varicella, it is alleged, cannot be communicated by inoculation. This is an error. Heim, who is quoted below, asserts that it is very communicable in this way; and Dr. Thompson, in his work on varioloid affections, gives abundant testimony on this point.

* Transact. of the College of Physicians, vol. i.

† An Account of the Varioloid Epidemic, &c. By John Thompson, M. D., &c.

5. The occurrence of small-pox does not prevent or modify varicella. Dr. Thompson, however, asserts, that out of one hundred and fifty-five persons whom he saw pass through the small-pox, "not one was afterwards affected with vesicular disease, although upon the supposition of the co-existence of a varicellous and a variolous epidemic, most if not all of this number must have been exposed to the influence of both contagions." If, indeed, we adopt this argument as valid, we must conclude the small-pox and the vaccine disease are essentially the same disease; for, as is well known, they mutually prevent or modify each other.

Symptoms.—Varicella is seldom attended with much fever. In many cases the febrile symptoms are scarcely obvious, yet in some instances the eruptive fever is almost as violent as in the severer cases of small-pox, and is attended with the same pains in the back, head, and extremities, as in this latter affection. The initial fever continues from one to three days, and terminates in the appearance of a vesicular eruption, which usually comes out first on the breast and back, next on the face and scalp, and lastly on the extremities. A troublesome tingling or itching in the skin generally accompanies the eruption. The eruption is often preceded, for a few hours, by a general erythematous rash, as in small-pox, or varioloid after vaccination. The varicellous vesicles generally come out in succession during three or four days, so that at the same time some of them will be just appearing, others are fully formed and filled with lymph; whilst some will be shriveling, and others again be already converted into scabs. The vesicles, in different cases, assume different appearances; and this has given rise to a division of the disease into three varieties; namely, the *lenticular*, and the *conoidal varicella*, and *swine-pox*. The eruption, in the first of these varieties, comes out very early, and consists, at first, of small, or rather oblong, red, flat, and shining elevations, with a minute vesicle in the centre, which, by the end of the second day, is somewhat enlarged and distended with a whitish lymph. This fluid assumes a pale yellow color on the succeeding day, and on the following or fourth day, the vesicle becomes shriveled, and in two days more is converted into a small brown crust. These scabs fall off about the ninth or tenth day, leaving red marks, but no depressions on the skin.

In the second or *conoidal* variety, the vesicles appear suddenly, and are surrounded by a slightly inflamed margin. On the first day they are elevated, pointed, and filled with a limpid serum; on the second day they are more distended, and contain a very pale, yellowish fluid. On the third day they wither; and at this time some of them contain a purulent matter; and these vesicles generally leave pits in the skin when the scabs fall off. Scabbing commences on the fourth day, some of the scabs acquiring a dark brown, and others a yellowish and semitransparent appearance. "A fresh eruption of vesicles usually takes place on the second and third day; and as each set has a similar course, the whole duration of the eruptive stage, in this species of varicella, is six days; the last formed scabs, therefore, are not separated till the eleventh or twelfth day."*

The third variety of varicella, or *swine-pox*, is characterized by large *globose* vesicles, with irregularly circumscribed bases, and inflamed margins. The transparent serum with which they are distended, assumes a whey-like color on the second day after their appearance, and on the succeeding day they begin to shrivel, and some of them contain a purulent fluid. (Bateman.)

Varicella may be communicated by inoculation; and it is alleged by Heim, that they are even more communicable than regular small-pox.† Reil states that small-pox is generally much milder when it occurs *after* varicella, than where this disease has not been gone through, more especially if the varicellous affection has been severe.‡ Varicella, like small-pox, rarely occurs more than once in

* Bateman, Practical Synopsis of Cutaneous Diseases.

† Heim, in Horn's Archiv. fur Medicinische Erfuhrung, bd. vii. heft. 2, Jahrg. 1809.

‡ Ueber die Erkenntniss und cur der Fieber, bd. 5, s. 386.

the same individual. It is never attended with secondary fever, but the scabs, on falling off, not unfrequently leave depressions in the skin. The pits, or cicatrices, left by the varicellous eruption, differ considerably from those which are produced by small-pox; and Heim, who regarded these two affections as essentially distinct from each other, has adduced this circumstance among others in support of his views. The pits of varicella, he asserts, are whiter than the rest of the skin, and quite smooth or even; whilst those left by variolous pustules are the color of the surrounding skin, and uneven like the surface of an orange. The margin of the varicellous pit is smooth and rounded, in the pits left by small-pox it is generally somewhat indented or angulated. Hairs never grow in the disks of the former, in those of the latter they do.

With regard to the remedial management of varioloid affections, it is only necessary to observe, that where the disease is so severe as to demand any medical attention, the treatment is to be conducted on the same plan that has been mentioned as proper in the milder varieties of small-pox. Varicella, however, very seldom requires any medicinal applications. Gentle aperients, and a mild antiphlogistic diet, are commonly all that is necessary.

Sect. IV.—*Rubeola, morbilli.*—*Measles.*

By the American, English, and French physicians, the terms *rubeola* and *morbilli* are applied to the same disease—*measles*. The German writers, on the contrary, universally designate two distinct diseases by these terms—applying the latter only to the present affection, whilst the term *rubeola* is used by them to designate a different, though somewhat similar disease (rothlen), described by Willan under the name of *roseola*.

Measles, like small-pox, seldom occur more than once in the same individual; and it would seem that a second attack of the former is even less frequent than of the latter malady.* I have met with one unequivocal instance only of this kind.

Home mentions a singular instance, where an attack of measles was followed by enlargement of some of the lymphatic glands. After a lapse of about six months, the glandular swellings subsided, and the patient became a second time affected with measles.† It does not appear, however, that the morbillous contagion possesses the same degree of activity as that of small-pox. Many individuals never become affected with the disease, however frequently they may be exposed to its contagion; and it is by no means uncommon to find in the same family some affected by it, whilst others will escape infection, though constantly exposed to its miasm.

Measles rarely occur sporadically. When they appear, many individuals usually become affected with them at the same time; and the progress of the disease can never be traced from house to house, or from street to street, as we may frequently do with small-pox or scarlatina. This, among other facts, has been adduced in evidence that the disease is not propagated by contagion; but the fact of its being communicable by inoculation, may be deemed sufficient to settle the point of its contagious character. Dr. Home succeeded in communicating the disease in this way in a number of instances; and more recent experience has fully demonstrated the practicability of morbillous inoculation.‡

* See Dr. Baillie's paper, in the Transactions of a Society for the Improvement of Medical and Chirurgical Knowledge, vol. iii.

† Medical Facts and Experiments. Richter, Specielle Thérapie.

‡ Vogel, Percival, Brown, Monro, and Tissot, recommended inoculation for measles; and Home and Horst practised it with success. More recently, Professor Sparanza, in an epidemic which prevailed in the territory of Mantua, employed inoculation for measles with decided advantage. Six boys in the House of Industry, and afterwards he himself, were inoculated. In all a mild and regular morbillous affection was the result. The experiment was afterwards repeated by himself and others with equal success. A slight cut was made into one of the most vivid of the large blotches with a lancet, the point of which was covered with the blood effused.

In its general course and phenomena, this, like other epidemic diseases, is subject to prominent modifications; and systematic writers have, in consequence, divided it into several varieties, according to the regularity or irregularity of its symptoms, the nature of the attending fever, and the character and violence of the local affections. It is evident, too, that this disease is much under the influence of atmospheric constitutions; for at one period it will be marked by symptoms so slight as scarcely to require any medical attention; at another, it will appear under a highly aggravated form; in a third period we may find it to occur under every grade of violence, from the simplest to the most malignant grades; and in a fourth, "it will hold a middle course between the mildest and most dangerous forms of the malady." (Armstrong.) Upon the whole, however, the regular and moderate cases are incomparably more frequent than the instances of a violent or malignant character.

In general, measles are apt to be more regular and mild during the warm and equable, than the cold and variable seasons; and constitutional habit or idiosyncrasy appears to have a very decided influence in modifying its character. It is from this latter circumstance that we sometimes meet with measles in all its grades of violence in children of the same family—several very remarkable instances of which have come under my observation.

It would seem, from the observations of some, that the *morbillous fever* sometimes occurs without any exanthematous affection.* Fevers accompanied with the usual catarrhal symptoms of this disease, though without the measly eruption, are by no means uncommon during the prevalence of epidemic measles; and Richter observes, that persons who have been thus affected, generally afterwards escape the morbillous disease during the subsequent progress of the epidemic.

Symptoms.—The period of incubation, or the time which intervenes between the first impression of the contagion of measles and the actual commencement of the disease, varies from a few days to two and even three weeks. In general, however, from five to seven days may be regarded as the latent period of the infection. In the patients which were inoculated by Home, the eruptive fever generally commenced about the seventh day after the insertion of the contagion.

The initial phenomena of morbillous fever do not differ from those which usually attend the beginning of catarrhal fever. A slight tenderness and redness of the eyes, with an increased flow of tears, sneezing, cough, and a watery discharge from the nostrils, together with slight creeping chills, and transient flushes of heat, are generally among the first symptoms of the disease. In some instances, the affection of the eyes and mucous membrane of the nose and respiratory passages does not supervene until about the second or third day of the fever. In all cases, however, prominent catarrhal symptoms sooner or later occur, and may be considered as among the specific phenomena of the disease. The cough is at first dry and harsh, and is attended with oppressed breathing, and some degree of soreness in the fauces. Some of the lymphatic glands along the neck and margins of the eyelids often become swollen and tender. About the third day, and occasionally earlier, considerable nausea and vomiting are apt to occur; and where the febrile symptoms run high, slight delirium sometimes takes place on the evening of this day. In cases of a violent character, more or less coma sometimes precedes for a few hours the appearance of the eruption; and in small children convulsions are by no means uncommon at this period. The fever is generally decidedly synochal; the pulse, in the ordinary forms of the disease, being frequent, hard, and quick, and the skin dry and very hot. Generally between the third and fifth days, the eruption makes its appearance in the form of

With this small incised punctures were made on the arm, and a proper bandage applied."—*Edin. Med. and Surg. Journ.*, 1826. See also *Bibliotheca Italiana*, Agosto, 1825.

* Morton mentions a morbillous fever which was wholly unaccompanied by an exantheme; and De Haen asserts, that cases of this kind frequently occur during epidemic measles.(*a*)

(*a*) *Febr.*, divis. vi. s. 6. See *Reil's Fieberlehre*, b. v. p. 216.

small red spots, apparently papular, first on the forehead, chin, nose, and cheeks, and then successively upon the neck, breast, body, and extremities. These red spots, which resemble flea-bites, soon enlarge; and as their number increases, they run into each other, and form larger patches of an irregular or semi-lunar shape,* leaving intermediate spaces in which the skin retains its natural color.—During the first day of the eruption, we may often notice a small vesicle in the centre of some of the measles. (Cazenave.)

During the second day after its appearance, the eruption in the face is at its highest state of development. On the following day it begins to fade and subside, whilst on the rest of the body it is still vividly red. On the face, the eruption may be felt slightly elevated above the surface of the skin; but on the other parts, the red patches do not appear to be sensibly raised. In severe cases, the whole face becomes considerably swollen; and in some instances the tumefaction is so great as almost to close the eyelids. The fading and subsidence of the eruption proceed over the body in the same progressive manner that the eruption made its appearance, so that by the eighth day from the commencement of the fever, it begins to disappear on the back of the hands, where it is wont to remain longest. About the ninth day, the eruption presents a faint yellowish appearance, and desquamation commences on the face, which by the tenth or eleventh day is completed over the whole body. The morbillous eruption is not confined to the surface of the body. It appears in red spots on the gums; over the mucous membrane of the mouth; upon the tonsils and uvula; and, according to Frank, on the tongue. Lieutaud saw the measly exantheme in the œsophagus, and upon the mucous membrane of the trachea, and even upon the surface of the abdominal and thoracic viscera.†

The fever does not remit on the appearance of the eruption; on the contrary, both the febrile and catarrhal symptoms usually become sensibly increased when the rash comes out. As soon, however, as the eruption begins to fade, an evident amendment in all the symptoms usually takes place; and in most instances, the fever disappears entirely by the time the rash has desquamated. Occasionally, indeed, the fever and cough continue, and even become worse after the complete disappearance of the measly exantheme. The coma, Dr. Heberden observes, sometimes returns in violent cases, after the rash has gone off.

About the time the eruption begins to decline, more or less diarrhœa is apt to supervene, which, if not violent, almost always mitigates the general and local symptoms. Sometimes copious diarrhœa takes place just before the rash is about making its appearance. This is to be regarded as an unfavorable occurrence, since it tends to interfere with the regular progress of the eruption, or to cause it to retrocede.

Authors generally state that the eruption of measles makes its appearance about the fourth day; and in the majority of instances this will be the case. It is of some importance, however, to bear in mind, that even in cases which go on regularly, the rash often comes out much earlier, and occasionally also later than the period just mentioned. Dr. Armstrong observes, "that the rash does not uniformly nor generally appear on the fourth day from the first development of the reaction. I have seen," he says, "the eruption come out at all times, between the first and seventh days, though, perhaps, the most common period is between the third and fourth day after the occurrence of reaction."

Such are the ordinary course and phenomena of measles. In its general character, as well as in the particular phenomena, it is subject, however, to various irregularities and modifications, which often demand special attention in the treatment of the disease. Throughout the whole course of measles there is

* Bateman observes, "that this character of the blotches of the measly eruption (their tendency to assume the irregular crescent shape) was first noticed by Willan, and is important; for, although entirely overlooked by ordinary observers, it is commonly very manifest, and therefore a valuable diagnostic."

† Précis de Médéc., p. 604.

generally a considerable tendency to inflammation, particularly of the eyes and the respiratory organs. Armstrong divides the disease into three varieties or modifications, the *simple*, *inflammatory* and *congestive*, and to these we may add the *typhous* and the *gastric* modifications.

1. The *inflammatory* variety* is characterized by a high grade of synochal fever; the pulse is vigorous, hard and frequent; the skin dry and very hot; the cough violent, painful, harsh and dry; the cephalalgia severe, attended frequently with considerable delirium during the night; the eyes very red; and the respiration much oppressed and often painful. Pleuritis; peripneumonia with bloody expectoration; cynanche trachealis; bronchitis; cerebral inflammation; or gastro-enteritis, are particularly apt to supervene in this modification of the disease. The rash commonly appears early, and is generally vividly red.

2. The *congestive modification* of the disease is characterized by the usual phenomena of an internal congestive state of the system. The reaction takes place slowly and imperfectly, and in some instances remains entirely oppressed. The face is pale, the pulse feeble and laboring, the bowels torpid, the breathing oppressed and slow, and the vital energies generally much depressed. If the internal congestions are not removed, coma or stupor, and in many instances, convulsions ensue. The eruption does not make its appearance, or it comes out slowly and imperfectly on some parts of the body. The extremities are cold, and the features sunk and anxious. This form of the disease is most apt to occur in young children, and in persons of a feeble and delicate habit of body. Dr. Armstrong has seen two instances of this kind, in which the patients died comatose and convulsed. In both cases he found the lungs greatly engorged on post-mortem examination.

3. The *typhous*, or, as it has been called, *malignant* variety of measles, is attended with the ordinary characteristic symptoms of a typhous state of the system. The heat of the skin is burning or acrid, (*calor mordax;*) petechiæ appear on those parts of the skin not occupied by the measly rash; colliquative hemorrhages, diarrhœa, and profuse sweats, are apt to occur; the vital energies are greatly depressed; the pulse generally weak and frequent, and sometimes nearly natural. This variety of the disease is always frightfully malignant and fatal. Fortunately, however, its occurrence is not common, although authors have described several epidemics of this kind. Sir William Watson has given an account of a putrid morbillous epidemic; but as he appears to have considered measles and scarlatina modifications of the same disease, it may be doubted whether the affection he describes was the former or the latter malady. Nevertheless, the description he gives of the particular phenomena of the disease answers much more unequivocally to measles than to scarlet fever.†

4. The *gastric modification* of measles derives its distinguishing phenomena from gastro-intestinal irritation, which in some instances modifies the general character of the disease very prominently. In cases of this kind, the febrile symptoms are not very conspicuous; the pulse is small, weak and unusually frequent; the cough is short, almost constant, and distressing. Violent vomiting and purging sometimes occur before, and immediately after the appearance of the eruption. The tongue is brown; the pain in the forehead severe; the measly rash pale and often indistinct; and a sense of tension and fullness is often felt in the epigastrium, or short cutting pains in the bowels. In some instances, great difficulty of breathing, and a sense of pectoral oppression, suddenly come on, particularly in young and irritable children. Sometimes the patient is extremely restless, with much jactitation, an anxious expression of the countenance, and dyspnœa, particularly on assuming the erect position. (Armstrong.)

* Strictly speaking, every case of measles is inflammatory; but the general and local phlogistic phenomena often predominate to such a degree, that such cases may with propriety be distinguished by the term *inflammatory*.

† Watson.—*Medical Observations and Inquiries*, vol. iv. p. 132.

Several German writers* describe a variety of morbillous disease under the name of *false measles*, which corresponds with the *rubeola sine catarrho* of Willan, and the *rubeola sine febre* of others. This modification of rubeola is characterized by a regular measly rash, without either catarrh, ophthalmia, or fever. It does not protect the system against a subsequent attack of febrile measles. "An interval of many months, even two years, has been observed between this variety and the subsequent febrile rubeola; but the latter more frequently takes place about three or four days after the non-febrile eruption." (Bateman.)

Sequelæ.—It has already been observed above, that the tendency to local inflammations is always very considerable in measles, and this tendency is generally particularly conspicuous during the periods of desquamation and convalescence. There are few, if any diseases, which leave the system so susceptible to the injurious influence of cold as measles; and it is, perhaps, chiefly from this circumstance, that inflammatory and other affections are so frequent during convalescence from this disease. It is, indeed, a common observation, that the affections which are apt to supervene on an attack of measles, are more to be dreaded than the disease itself—and in reference to the ordinary or regular form of the disease, the remark is generally correct.

The affections most apt to occur after measles, or during the period of desquamation, are pneumonia, croup, rheumatism, chronic ophthalmia, otitis, arachnitis, and bronchitis. In phthisical habits, an attack of measles often develops the tubercular action rapidly. It would seem that the morbillous affection has an especial tendency to develop lymphatic diseases, and to rouse into action the strumous habit. Porriginous eruptions about the head, serous ulcerations behind the ears, scrofulous ophthalmia, strumous swellings about the neck, and other scrofulous disorders, are frequent sequelæ of the disease. Sometimes induration of the mesenteric glands, and marasmus, ensue. Herpes, anasarcous swellings, discharges from the ears, and boils on different parts of the body, are among the occasional consequences of this disease.

Diagnosis.—From the earliest records we have of this disease down to the time of Withering, (1793,) measles were generally confounded with scarlet fever.† The diagnosis between these two affections is, indeed, sometimes attended with considerable difficulty; yet the catarrhal symptoms, and the character of the morbillous eruption, will always enable an experienced observer to distinguish rubeola from scarlatina. The small vividly red spots, like flea-bites, their union into irregular semilunar patches, and the natural color of the intermediate skin, distinguish the measly rash from the large, irregular, more uniform, and raspberry-colored efflorescence of scarlatina. In the former disease, the rash generally consists of small red spots running into each other, with the central points more vivid than the coalescing margin, so as to give a maculated appearance to the skin. In the latter disease, the redness is more diffused and uniform, consisting of an infinite number of very minute red points united together, resembling much the redness of a *boiled lobster*. These two affections differ from each other also in their general course of progress. The rash of measles generally comes out about the fourth day from the commencement of the fever. In scarlatina the eruption usually comes out on the second, and not unfrequently on the first day. The coryza, sneezing, hoarse and dry cough, inflamed and watery eyes, so rarely absent in measles, can seldom fail to establish a certain diagnosis.

Prognosis.—Measles is not, in general, a very dangerous disease. It is only from becoming complicated with internal inflammation, or from having its regular progress interrupted by some accidental cause, that the disease is apt to assume

* Vogel, Handbuch, bd. 3, p. 203; Metzger, Vermischte Schriften, bd. 2, p. 167.

† Bateman says, that "the publication of Dr. Withering's Essay on *Scarlet Fever*—or rather the second edition of that work in 1793, may be considered, perhaps, as the date of the correct diagnosis of this disease."—*Synopsis*, p. 66.

a very dangerous character. However violent the proper morbillous symptoms may be, provided the disease goes on regularly in its course, the danger is not often very great. According to the estimate of Percival, about one out of fifty cases of rubeola terminates fatally; and of this proportion one half are in subjects under two years old. Epidemics of this disease, of the most fatal character, have indeed been noticed.* Violent internal congestions, so as to prevent the development of febrile reaction, the sudden retrocession of the rash, soon after its appearance, from violent purging, the application of cold, or spontaneously or from whatever cause, always greatly increase the danger. The occurrence of internal inflammation, particularly of the lungs, brain, or trachea, is a very alarming accident. Great difficulty of breathing, with a wheezing sound in the trachea, though not depending on inflammation, is attended with much danger in infants. Colliquative hemorrhages, petechiæ, and great muscular prostration, are among the most unfavorable signs. Women in the latter period of pregnancy, or in the puerperal state, are exposed to great risk from an attack of this disease. In general, nervous, delicate and debilitated subjects are more apt to sink under this disease than persons of healthy and vigorous constitutions.

Treatment.—In relation to the treatment of this disease, the practitioner will do well to bear in mind an important truth contained in the following observation of Dr. Armstrong. "From an impartial consideration of the facts which have come before me," says this writer, "I am convinced that our plan of treating measles (in its regular form) is too uniformly active when the eruptive fever is developed; and that we should be more fortunate in the main, if we interfered less with the operation of nature in cases of a mild and regular character." Of the importance of this observation I am thoroughly persuaded, both from my own experience and from what I have had occasion to witness in the practice of others. Even where the general febrile excitement is considerable during the eruptive fever, an active antiphlogistic or depletory treatment is not only generally unnecessary, but sometimes decidedly injurious, provided no local inflammations be present. We must view the eruption in this, as in other exanthematous affections, as a sort of critical or metastatic deposition on the surface by which the animal economy endeavors to relieve itself from some internal morbific irritation. The appearance of the rash is essential to the perfect and safe resolution of the disease, and whatever greatly interferes with the regular progress of the precursory fever, has a tendency also to interrupt the regular appearance and character of the eruption. When, therefore, the eruptive fever is regular, not very violent, and unattended with internal inflammations or congestions, the remedial treatment should be gentle. In general, all that is required in such cases, is to keep the bowels open by mild laxatives, and to allow the patient the free use of tepid diluent drinks; and in instances attended with a very moderate degree of febrile reaction, some of the mildly stimulating diaphoretic ptisans, such as infusions of sage, elder blossoms, marjoram, balm or eupatorium, should be ordered. In cases attended with a high grade of fever, moderate abstractions of blood are, without doubt, proper, and ought certainly not to be neglected. The refrigerant diaphoretics, also, are decidedly indicated, and often suffice, without bleeding, to procure an adequate reduction of the general excitement. I have generally preferred the following mixture.† Small doses of antimonial wine, with sweet sprits of nitre, the saline effervescing draught, the ordinary nitrous powders, and particularly the mixture mentioned at page 135, may be usefully employed for this purpose.

* It is from the great fatality of such epidemics that this disease obtained the name *morbillus*, or little *plague*. Were these epidemics measles? Both small-pox and scarlatina were formerly confounded with measles.

† ℞.—Muriatis ammoniæ ʒiii.
Pulv. extract. glycyrrh. ℥ss.
Tart. antimonii gr. i.
Aq. fontanæ ℥viii.—M. Dose—a dessertspoonful every two hours for a child between two and five years old.

Although an active treatment is unnecessary, and often prejudicial in the regular form of measles, this is by no means the case when the disease becomes complicated with the visceral inflammation, oppressive internal congestions, or other irregular and dangerous symptoms. When after the initial stage of oppression, the febrile reaction does not take place, and the face remains pale and sunk, the pulse feeble, and the breathing oppressed, with great prostration, and a torpid state of the sensorial powers, prompt and decisive measures must be adopted to remove the internal congestions, and to excite the reaction of the heart and arteries. If this be not effected, the eruption will not come out, and the patient will sink into a state of fatal stupor or coma. The treatment already given as proper in the congestive form of typhus, must be actively employed in such cases. The warm bath, stimulating frictions of the skin, hot flannel, or bottles filled with hot water applied to the body and extremities, sinapisms to the epigastrium, together with the use of warm and gently stimulating drinks, are the principal means upon which our dependence is to be placed in instances of this kind. Dr. Armstrong recommends moderate bleeding; but although a great advocate of depletion in the congestive state of fevers, he thinks that in congestive measles the lancet should be used with particular caution. The observations I have made on this point, when speaking of the treatment of typhus, are equally applicable in this place. In several instances of congestive measles, I have employed camphor suspended in a mucilaginons fluid, with obvious benefit. I have also used the carbonate of ammonia, in the formula mentioned at page 148, with very good effect in a few instances of this kind. Both these stimulants are, however, more decidedly beneficial, where the rash, after it has come out, suddenly recedes, than in the congestive state which precedes the exantheme. If in cases of this kind great difficulty of breathing, with a short dry cough, and irregular distribution of the animal temperature—"some parts being cool or cold, whilst others are preternaturally warm,—"and a feeble and quick pulse, with a death-like paleness of the face, occurs, the danger is imminent, and unless prompt relief be obtained, "the patient sinks rapidly under an apparent load of phlegm in the bronchia." (Armstrong). *Camphor* especially is a valuable medicine where a retrocession of the eruption occurs. Armstrong speaks very favorably of a large dose of calomel, in union with camphor, the pulvis antimonialis, and a few drops of laudanum, in this congestive condition of the disease. When this accident is produced by excessive diarrhœa or vomiting, opium in union with camphor is the appropriate remedy. In conjunction with these remedies, blisters, sinapisms, stimulating frictions, the warm bath, or warmth applied to the surface in a dry way, may be deemed indispensable in such cases. It should be observed, however, that moderate diarrhœa, except in very feeble subjects, is rarely attended by any unfavorable effects; and in most instances procures considerable relief. In robust and plethoric subjects especially, a moderate looseness of the bowels should not be interfered with unless symptoms of its injurious influence upon the regular appearance and course of the rash supervene. (Armstrong.)

In cases complicated with visceral inflammation, a vigorous antiphlogistic treatment is demanded. Whatever may be thought of the employment of bleeding in simple and regular cases, there can be no question as to the general propriety of resorting to this measure promptly and actively when visceral inflammations supervene. General and local abstractions of blood, blisters applied over the region of the affected part, mild laxatives, antimony, and nauseating doses, are the measures upon which our chief dependence must be placed. When bronchitis or peripneumonia supervenes, much good may often be derived from *antimonial emetics*, more especially in very young children. Whatever organ, in short, may become the seat of the inflammation, it will be necessary to adopt such measures as are proper for the existing inflammation, independent of the morbillous affection, paying attention only to the grade or character of the accompanying fever.

Measles, attended with pneumonic and other varieties of visceral inflamma-

tion, has indeed occasionally occurred, in which bleeding is said to have been not only useless, but often unequivocally detrimental. Of this kind was the very fatal epidemic which prevailed at Paris in 1828; which, though almost always complicated with inflammation of important organs, more especially with pneumonia, was found unmanageable by sanguineous evacuations.* In cases of this kind, opium and calomel would, perhaps, answer well. I say, perhaps; for I have had no experience in instances of this dangerous and typhoid character; yet, from the excellent effects which I have derived from this combination in *pneumonia typhoides*, I should without hesitation give it a trial in this modification of measles. Blisters, cupping, and the warm-bath, may be deemed indispensable in such cases.

It is of great importance, in the remedial management of measles, to guard the patient against the influence of variable temperature. Neither a very cool, nor a warm and confined air, is proper in this disease. An equable temperature, which produces neither a feeling of much warmth nor *chilliness*, is the most suitable. When the eruptive fever is very moderate, and the patient of a feeble and irritable habit, the temperature of the sick chamber should be such as to communicate a moderate sensation of warmth, and this is more especially proper in congestive cases.

I have already adverted to the various disagreeable and dangerous affections which are apt to ensue during convalescence from this disease, and to their frequent dependence on the injurious effects of cold during this period. To obviate such consequences from this source, the patient ought to remain within doors, and to avoid every other exposure to the influence of a cold and damp atmosphere. "Even in summer, convalescents should not be suffered to go out of doors except in the middle of fine days, and not without additional apparel." (Armstrong.)

The diet, during the declension of the disease and period of convalescence, should be mild and unirritating, and all kinds of stimulating drinks be carefully avoided. If the skin is dry and the pulse remains irritated after the rash has disappeared, advantage may be obtained from some of the more gentle antiphlogistic diaphoretics, and it will often be proper to continue their use during convalescence. The spiritus mindereri, with a small portion of sweet spirits of nitre, and of vin. antimon., forms an excellent diaphoretic at this stage of the disease. Where the pectoral symptoms continue to be troublesome during convalescence, the *muriate of ammonia*, with vinegar of squills, and antimony, is one of our most useful remedies.† Tonics are almost always injurious during convalescence from measles. When the system is left exhausted and free from irritation, mild nourishing diet, with a weak infusion of serpentaria, will usually answer to promote the return of vigor and health.

I conclude what I have to say on this subject, by the following very interesting observations of Dr. Armstrong: "It is a remarkable fact," says this writer, "that when any cutaneous affections arise after measles, the internal organs generally remain free from disease; and even where some internal disorder has existed, I have not unfrequently seen it disappear on the occurrence of some spontaneous eruption of the skin. Indeed, there are many cases of this nature already on record. At all times we should, therefore, be most wary in meddling with vesicles, pustules, boils, and the like, when they come out after the measles; for although they may be temporary blemishes on the surface, they are often the occasion of saving the vital works within."

* See Biett's Report in the *Journal Hebdomadaire*, No xlii.

† ℞.—Muriat. ammoni. ʒiii.
P. extract. glycyrrh. ℥ss.
Aq. fontanæ ℥vii.
Acid. scillæ ℥ss.
Vin. antimon. ʒi.—M. S. Dose—a tablespoonful every four hours for an adult.

Sect. V.—*Scarlatina—Scarlet Fever.*

Scarlet fever appears under every grade of violence, from the simplest and least dangerous to the most severe and malignant forms of disease. *Fever*—a peculiar *exantheme* and *inflammation in the fauces*, terminating rapidly, in some instances, in ulceration and sloughing, constitute the essential phenomena of the disease. In relation to the particular character and violence of these morbid conditions, authors have divided the disease into three varieties, namely, *S. simplex*, *S. anginosa*, and *S. maligna*.

Symptoms of S. simplex.—After an indefinite period, varying from one to three or four days, of the ordinary premonitory symptoms of febrile diseases, the patient is seized with slight chills, alternating with transient flushes of heat, depression, nausea, pains in the loins, lower extremities, and head, a hot and dry skin, and a frequent and quick pulse. Generally within the first forty-eight hours after the commencement of the fever, a scarlet eruption comes out, first on the face, and then successively on the neck, trunk, and extremities, spreading finally over the surface of the mouth, fauces, and nostrils, and may even, in some cases, be seen on the albuginea. This rash consists of innumerable red points, which, running into each other, give a diffused blush to the skin, resembling much the shell of a boiled lobster. (Armstrong.) In some cases the scarlet effloresence is uniformly diffused over the whole surface of the body; in others, it appears only in large irregular blotches, leaving the intermediate portions of skin of the natural color. The miliary glands and papillæ of the skin are usually somewhat enlarged, giving a slight roughness to the surface, more especially on the breast and extremities. When the skin is pressed with the point of the finger, the redness disappears for a moment, leaving a transient white spot.—With the commencement of the fever, or soon after its accession, a slight soreness of the fauces, attended with some difficulty of swallowing, occurs, and the voice usually becomes thick and less sonorous. In most instances the face becomes slightly swelled; the tongue is covered with a thick white fur, through which the enlarged papillæ exhibit their scarlet points, and its edges and extremities are generally red; the skin is very hot, and the pulse frequent, quick, and sometimes tense and vigorous. There is seldom much thirst, and the appetite is always much depressed. Considerable restlessness, and occasionally slight delirium, occurs during the evening exacerbations, both of which symptoms, however, generally disappear on the approach of morning.

On the fourth day, the eruption and fever are generally at their complete state of development, and on the fifth day both usually begin to decline, and continue to diminish, *pari passu*, until they have gone off entirely, about the end of the seventh day. On the following day, the skin begins to desquamate. When the eruption is about disappearing, the tenderness of the fauces abates; the perspiration is free; the urine deposits a copious reddish sediment; and in some cases diarrhœa takes place. Desquamation is usually attended with considerable itching, and frequently leaves a slight tenderness of the skin over the whole body. Occasionally a considerable abatement in the febrile symptoms takes place as soon as the eruption makes its appearance. In some instances, indeed, the fever is from beginning to end so slight as scarcely to attract notice; but on the other hand, cases occur in which the general arterial excitement is very strong. The disease sometimes commences and proceeds for a day very mildly, and then suddenly assumes all the violence characteristic of the *anginose* variety.*

* In reference to cases of this kind, Dr. Armstrong makes the following observations: "Simple excitement may readily produce inflammation, and in fact is the most frequent cause of it; for if there be a latent weakness in any organ, the simple excitement, if not timely moderated, is sure to give rise to inflammation there. It is on this account that many diseases merely marked by simple excitement at the beginning, are complicated with inflammation in their progress;

S. anginosa.—In this form of the disease, the fever and the anginose affection are much more violent than in the former variety. The forming stage of *S. anginosa* is almost always attended with considerable headache, præcordial oppression, nausea, sometimes vomiting, and general muscular prostration. The fever is accompanied, from its commencement, with a feeling of stiffness and dull pain in the muscles of the neck and under the ears and angles of the jaw. Frequently, indeed, these local symptoms precede the occurrence of the fever; and on examining the fauces, the palate, tonsils and uvula present a red and slightly tumid appearance. The voice soon becomes hoarse, deglutition painful and difficult, and respiration is attended with a disagreeable sense of constriction in the throat. The febrile symptoms rise rapidly to their acme; the pulse acquires great frequency and quickness, but is rarely either so vigorous, tense, and full, as in the simple variety of the disease. The thirst is generally urgent, and the heat of the skin more intense than in any other febrile affection. Currie and Willan have found the temperature of the surface as high as 108 and even 112 degrees of Fahrenheit's thermometer. The tongue soon becomes dry, and very florid along the edges, with the inflamed papillæ projecting from its surface. Considerable uneasiness or pain is felt in the head, and much restlessness, languor, and prostration prevail throughout the whole course of the disease.

The eruption does not generally come out as early in this as in the simple variety. It usually makes its appearance on the third day of the fever, and is seldom diffused over the whole surface, coming out in irregular and not very large patches on different parts of the body, particularly about the elbows. In some instances, the efflorescence disappears the day after it has come out, and "reappears partially at uncertain times, but without any corresponding changes in the general disorder; and the whole duration of the complaint is thus lengthened, and the desquamation is less regular." (Bateman.)

When the fever declines as early as the fourth or fifth day, the tonsils and palate seldom become ulcerated, the swelling and inflammation in the fauces passing off with the fever and the eruption without ulceration; but, when the fever is protracted beyond this period, or when it is violent during the first three or four days, small ulcers form about these parts, which are rapidly converted into ash-colored superficial sloughs. There is always a considerable quantity of viscid mucus secreted in the fauces, which often concretes into white flakes upon the inflamed parts, and presents the appearance of ulcers where in reality none exist. The parts should, therefore, be carefully examined before an opinion is expressed as to the existence of ulcers. (Armstrong.) As the fever declines, the sloughs in the throat begin to separate, and leave red ulcerated surfaces, which generally cicatrize without difficulty. Sometimes, however, instead of separating about the eighth day, the sloughs enlarge, become brown, and discharge an acrid sanious fluid; and in such cases the glands about the neck are generally swollen, hard, and painful; and the patient is harassed with painful diarrhœa and tenesmus. The inflammation occasionally extends into the trachea, and the patient dies under symptoms of acute bronchitis. The brain often becomes prominently affected during the eruptive stage, giving rise to deep and fatal coma. Abdominal inflammations may likewise supervene. "At first there are only slight pain and soreness in some parts of the abdomen, with a quickened pulse and hurried respiration; but the pain and soreness gradually increase, and at length are attended with vomiting, eructation, fullness of the belly, and general restlessness. In six, seven, or eight days, the abdominal soreness and pain abate or disappear, while the pulse grows rapid and feeble, the breathing

and hence it is that apparently benign seizures of scarlatina may eventually become the causes and concomitants of serious affections of some of the viscera. It is, indeed, only in subjects of the soundest constitutions that we ever see simple excitement uncombinedly exist throughout the disease; and the reason why it so frequently occasions inflammation is, that some tissue or other had been secretly in fault before its occurrence.—*On Measles, Scarlatina, &c.*, p. 157.

more anxious, and the vomiting more urgent. Cold clammy sweats, and a universal collapse, now speedily supervene, and are the immediate precursors of death." (Armstrong.)

S. maligna.—Although this form of the disease usually commences like the preceding variety, it soon betrays its violent and dangerous character. The eruption comes out at uncertain periods from the second to the fourth day; and is usually pale when it first makes its appearance, acquiring, in most instances, a dark or livid hue in the progress of the disease. It is also very irregular in its duration, and often suddenly disappears soon after it has come out, and reappears on some parts of the body two or three days afterwards. The temperature of the skin is variable, and not generally very intense; and the pulse, though in the commencement active, becomes small and feeble in the course of the second day. Delirium generally occurs at an early period, and often continues with occasional intermissions and exacerbations, throughout the subsequent course of the disease. In nearly all cases the sensorial functions suffer very considerable disturbance; and, in aggravated instances, the eyes are dull and inflamed, and the cheeks suffused with a livid flush. The tongue is dry, and covered with a brown or dark fur; the breath fetid. On examining the fauces, gray-colored sloughs are seen on the soft palate and tonsils, which soon acquire a brown, and at last a dark color. The disease, however, sometimes terminates fatally under symptoms of cerebral oppression, before the ulcers in the throat become extensive, or acquire a very bad appearance. "In general," says Dr. Armstrong, "it is only when the fever is protracted beyond the fourth day that the ulcers are converted into ill-conditioned, black, and fetid sloughs." There is generally a large quantity of very viscid mucus secreted and lodged in the fauces, giving rise to difficulty of respiration and a rattling noise in the throat. When the sloughs are foul and extensive, a thin acrid fluid is usually discharged from the nose, occasioning irritation and excoriation of the parts with which it comes in contact. In cases of a particularly violent character, collapse supervenes towards the middle or end of the second week of the disease. When this occurs, the heat of the surface sinks; the pulse becomes very frequent and feeble; the tongue dark, brown, or black; the animal powers greatly prostrated; painful diarrhœa often ensues, and in some instances petechiæ and hemorrhages from various parts occur towards the fatal termination of the disease. The fever and ulcerous affection of the throat frequently exist without an eruption at any period of the disease. Death sometimes takes place as early as the second or third day, and Bateman observes, that occasionally the symptoms continue to be moderate until an advanced period, when they suddenly assume a malignant and rapidly fatal character.

Dr. Armstrong has described *three* modifications of *malignant* scarlet fever—namely, the *inflammatory*, the *congestive*, and the *mixed*; the latter being attended, he says, at once with much internal congestion, and a moderate reaction of the heart and arteries.

The first of these modifications (inflammatory) corresponds with the *putrid* variety of Richter.* It commences with violent fever; the pulse is full, strong, and hard; the heat of the surface intense; delirium occurs early; in short, all the symptoms indicate a high grade of inflammatory excitement. The eruption comes out early, and is at first vividly red, assuming a darker or purple hue as the disease advances. In its commencement, and for a day or two, it resembles *s. anginosa*, differing from this variety in the early supervention of a typhous state or collapse, and in the affection of the throat assuming, in a few days, the gangrenous condition mentioned above. At an early period of the disease the animal powers sink; the pulse becomes small, feeble, and frequent; the heat of the surface acrid and burning; the rash purplish; colliquative diarrhœa and hemorrhages, and occasionally petechiæ, or a miliary eruption, ensue. The most characteristic circumstance of this modification, however, is the extremely vio-

* Specielle Thérapie, bd. ii. p. 466.

lent degree of the anginose affection, and its decided and early tendency to terminate in extensive gangrenous ulceration. It is this modification of the disease that was formerly commonly described under the name of putrid sore throat.

In the congestive modification the reaction does not ensue. The patient becomes pale, faint, and oppressed; he complains of deep-seated pain and sense of weight in the head, attended with giddiness, nausea, much anxiety and oppression in the præcordia, and great muscular prostration. Respiration is quick, short, or slow and impeded, " and there is often a mixture of lividity and paleness in the face, and the eyes are usually dull, acquiring a fatuous or inebriated expression in the course of the disease. The mind, at first alarmed and confused, or dejected, soon becomes disordered with delirium; or an indifference to surrounding objects, and a stupor succeed, under which patients frequently expire." The pulse is slow, irregular, and weak; at first the tongue is covered with a white fur, which becomes rough and brown in the progress of the disease. The bowels are torpid in the beginning, but towards the termination of the disease, diarrhœa almost always occurs in fatal cases. This modification of the complaint seldom runs a protracted course, and frequently proves fatal as early as the second, third, or fourth day. Colliquative hemorrhages from the nose, mouth and bowels, petechiæ and gangrenous spots, are by no means uncommon towards the fatal conclusion of the disease. In this modification, the rash, from the commencement of its appearance, is pale or of a copperish hue, acquiring at last a purple aspect.

The anginose affection is seldom very violent. Dr. Armstrong thinks that the affection of the throat is rarely the cause of death—its fatal tendency depending chiefly on the " venous congestions of the brain, liver, spleen, lungs, and of the vessels of the heart, giving rise to universal collapse and visceral disorganization," and perhaps to a change in the constitution of the blood itself.

Sequelæ.—Scarlatina, like measles, is frequently followed by various troublesome and often dangerous disorders; amongst which, *anasarca* is by far the most common. There is, indeed, no acute disease which is so apt to be succeeded by dropsical effusions as scarlet fever; and this is especially the case with the *anginose* variety. These swellings seldom occur before the ninth or tenth day after the eruption has gone off, and continue usually two or three weeks. Bateman observes, that " when the anasarca becomes pretty general, a sudden effusion occasionally takes place into the cavity of the chest, or into the ventricles of the brain, occasioning the death of the patient in a few hours." In general, however, the dropsical effusions which occur after scarlatina, are not attended with much inconvenience or danger. The malignant and anginose varieties are sometimes followed by abscess of the tonsils, enlargement of the parotids, inflammation of the testicles, ophthalmia, deafness, and inflammation of the mucous membrane of the alimentary canal, otitis, suppuration of the glands about the neck, chronic cough, excoriations about the nates, and bronchitis, or other slow suppurative inflammations, with hectic fever and its consequences. It is observed by Dr. Armstrong and others, that the hair is very apt to come out on the abatement of scarlatina, and that it often never looks or grows well afterwards. Various nervous affections have also been known to occur as sequelæ of this disease:—such as hysteria, spasmodic asthma, chorea, epilepsy,* and neuralgic pains in the extremities. Strumous affections, chronic cutaneous eruptions, gutta serena, herpes, and rheumatic pains, are occasionally the consequence of the disease. The more perfectly and obviously the cuticle desquamates, the less apt are secondary diseases to supervene during convalescence.

Diagnosis.—The only diseases with which scarlatina is liable to be confounded, are measles and miliary fever; and in the simple and anginose varieties, the diagnosis is indeed sometimes attended with very considerable difficulty.

* Kreysig, Abhandlung über das Scharlachfieber, &c., p. 99. See also Cappel. Abhand. von Scharlachsauschläge, p. 90. Reil, Fieberlehre, bd. 5, p. 122.

There is not a single symptom which can be regarded as absolutely peculiar and characteristic of scarlet fever. The eruption is sometimes wholly or nearly absent, is diffused or in blotches, and occasionally papular; and the angina varies from only a slight redness to much tumefaction, with or without ulceration and sloughing. Nevertheless, the following circumstances will almost always enable us to distinguish scarlatina from measles. In the former the eruption generally comes out within the first forty-eight hours of the fever; whereas in measles the rash rarely appears until the third, and most commonly not until the fourth day. The eruption in scarlatina appears like a diffused erythematous blush of the skin, with innumerable points intermixed with small papulæ, dispersed over the cuticle. The rash of measles, on the contrary, consists of small circular dots, like flea-bites, of a deeper red in the centre than at the circumference, so that, in running into each other, the skin presents a less uniform blush than in scarlatina. These red and slightly elevated dots generally appear in clusters or patches, assuming an irregular *crescent shape*. "The crescent-like form of the patches of measles," says Bateman, "and the more diffuse and irregular shape of those of scarlatina, will be a material diagnostic guide." The color of the eruption of scarlatina usually resembles that of a boiled lobster shell. In measles it is generally of darker red, inclining slightly to brown. The most prominent diagnostic symptoms between these two affections, however, are the catarrhal phenomena, which are almost invariably very conspicuous in measles, whilst in scarlatina they are either altogether absent, or extremely slight and partial. The inflamed eyes, profuse discharge of tears, sneezing, coryza, strong, harsh, and hoarse cough, intolerance of light, and red and swollen edges of the eyelids, so seldom absent in measles, are but very rarely noticed in scarlet fever. In the malignant and anginose varieties of scarlatina, the ulceration and sloughs which appear in the fauces are sufficiently characteristic to distinguish this affection from measles.

In some instances, simple scarlatina assumes so much the general appearance of miliary fever, that on slight examination it might be readily mistaken for this latter affection. They may be distinguished by the miliary eruption being almost universally attended with considerable perspiration, which is not the case on the appearance of the efflorescence of scarlatina. The little points or miliary papillæ of the rash of scarlet fever, rise out of a uniformly erythematous blush of the skin, whereas those of miliary fever appear to be seated on a skin possessing its natural color. The coming out of the miliary eruption is generally attended with great anxiety in the præcordia; and when it is about declining, a second eruption, similar to the first, sometimes comes out; and in some instances a third crop of papulæ supervenes.

Prognosis.—The prognosis in scarlatina must of course be extremely various, since the disease assumes every grade from the mildest to the most fatal degrees of violence. In the simple variety, little or nothing in general need be apprehended for the safety of the patient, unless dangerous secondary affections supervene during the declension or period of convalescence, from cold or other accidental causes. But the prognosis ought to be cautious, even in cases which appear at first under mild symptoms; for the disease will sometimes go on for a few days in a regular and simple form, and then, all at once, assume a highly dangerous grade of violence; and this is more especially apt to be the case when the epidemic generally is of a severe character. The *anginose* variety of the disease can never be regarded as free from particular danger; and the malignant variety is to be accounted among the most fatal maladies. It is generally, and perhaps justly, considered that the danger in scarlatina is to be estimated by the character and violence of the affection of the throat. Dr. Armstrong, however, seems to be of a different opinion: at least, the affection of the throat, abstractly considered, he thinks, is rarely the cause of death—a termination which he refers rather to violent internal venous congestions and visceral disorganizations, so common in the more violent grades of this disease. When the eruption is bright red, and uniformly diffused over the whole or the greater part of the body, the

prognosis is better than when it is pale, or purple, or brownish, and appears only here and there in large patches. (Armstrong, Reil.) A variable eruption, being by turns red, pale, and brownish; appearing now principally in one part, and then in another; going off for a time, and again making its appearance, or finally suddenly, and at an early period, vanishing entirely, are unfavorable indications. A white streak passing down on both sides of the nose and encircling it below, is said to be a fatal symptom. (Reil.) If on a sudden a strong inclination to pass urine occurs, and a copious flow of crude watery urine takes place, the danger may be considered great. (Richter.) When the inflamed fauces are of a bright red color, considerably tumefied and attended with painful swallowing, the prognosis is better than when the inflamed parts are dark-red or livid, and without swelling and difficult deglutition. White sloughs in the fauces are more favorable than ash-gray or brown ones. The occurrence of gangrenous ulceration is of course of very alarming import.

It is scarcely necessary to say that the grade and character of the attending fever have an important bearing on the prognosis. A moderately active state of the reaction is favorable: a typhous grade is the reverse; and when the fever is extremely violent at first, with much angina, there is great reason to apprehend early and dangerous collapse. Violent internal venous congestion, by which the development of febrile reaction is prevented or much impeded, is always indicative of the utmost danger. The supervention of visceral inflammation is no less alarming. These are generally soon followed by collapse, and if death does not take place early, great prostration ensues, with the fatal symptoms of coma, constant delirium, cold extremities, and if to these are added petechiæ, colliquative hemorrhages, and involuntary evacuation of fæces, a speedy dissolution may be predicted with certainty.

In general, scarlatina is apt to be more mild in children than in adults, except when the former are suffering from painful dentition. The disease is said to be most dangerous when it occurs in persons between the ages of fifteen and twenty-five.* It is also attended with particular danger when it attacks pregnant women, and especially in the puerperal state. In general, robust and healthy individuals bear the disease much better than persons of a weak, lymphatic and nervous temperament.

A regular abatement of the heat and efflorescence of the skin, accompanied with a lateritious sediment in the urine; a subsidence of the swelling, and of the frequency of the pulse; with separation of the sloughs and healthy granulation of the ulcers; and finally, desquamation of the cuticle, are indicative of a favorable termination of the disease.

Cause.—Scarlatina arises from a specific contagious miasm or principle, which, like most other febrile contagions, appears to be much under the influence of certain occult atmospheric temperaments, as is manifest from its occasional epidemic prevalence, as well as from the various grades of violence and diversity of character which different epidemics have been known to assume. It agrees, moreover, with the contagion of small-pox and measles, in destroying the susceptibility of the system to its subsequent morbific influence; although exceptions to this rule have been noticed, the disease having in some instances, though extremely rarely, occurred a second time in the same individual. There has been much controversy in relation to this latter point. Withering and Willan assert that they never witnessed a second attack of the disease, and they deny the possibility of this occurrence; and Bateman observes, "that this fact is now fully ascertained." Cases of second attacks have nevertheless been adduced by authorities equally respectable, and the reality of this occurrence, though rare, appears to me sufficiently established.

Bicker,† Neuman,‡ Binns, and others, mention instances of this kind; and

* Reil, loc. cit., vol. v. p. 138.

† Beschreibung eines Scharlachfiebers.—Rotterdam, in 1778 and 1779, p. 162.

‡ Aufsätze and Beobachtungen fur Aertze, p. 284, as quoted by Reil, loc. cit. t. v. p. 136.

Richter observes, that cases of a second, nay, even a third attack of scarlatina, have been noticed.* Some individuals are wholly insusceptible to the operation of this contagion, and never become affected with the disease, however frequently they may be exposed to its cause. Accidental predisposition, age, and idiosyncrasy of constitution, have of course as great influence on the activity of this as of other contagions. The period which intervenes between the first impression of the contagion and the manifest commencement of the disease, varies from three to five or six days. It is asserted that the contagion emanating from an individual affected with the disease, is most active during the period of desquamation. (Cazenave.) Although unequivocally depending on a peculiar contagion, yet "there is abundant evidence that fever attended with scarlet eruption, and possessing all the other characters of this disease, does occasionally arise from exposure to cold."†

Scarlatina occurs at all seasons, but it has been observed that warm and damp weather, and the air of low and marshy districts, have a tendency to promote the dissemination as well as the violence of the disease. It is also said, (Reil, Richter, Steiglitz,) that the disease is more apt to affect females than males; and general observation goes to show that nurslings and old persons are much less subject to the influence of its contagion than individuals during the intermediate ages. Some epidemics affect scarcely any but children; others seize almost exclusively on adolescence and adults. Reil says that he has seen malignant epidemic scarlatina which was almost entirely confined to persons between the ages of fifteen and twenty-five. The progress of epidemic scarlet fever is sometimes very irregular. The disease, though very violent and general, sometimes suddenly abates so as almost to disappear, and after awhile resumes its power and rages with still greater malignity. Occasionally the contagion appears to linger for several years in a certain district, a few patients only becoming, from time to time, affected with the disease.

Treatment.—From what has been said of the various symptoms and characters which scarlatina may present, it is at once obvious, that the remedial management of the disease must be greatly modified in the different varieties which it is wont to assume. In the simple form of the disease, nothing but the mildest antiphlogistic treatment is necessary. One or two gentle aperients, or enemata; a mild, unirritating liquid diet; cool or tepid drinks, such as barley-water; toast-water, acidulated with lemon-juice, or muriatic acid, or lemonade; confinement in a moderate and equable temperature; with the use of slightly astringent and emollient gargles—such as sage-tea, with a small portion of alum, and sweetened with honey; or an infusion of green tea, is all that is, in general, necessary to resort to in cases of this kind. But even the simple form of the disease occurs, occasionally, under symptoms of very considerable febrile irritation, and may, by the continuance of the high excitement, assume the severer character of scarlatina anginosa. No regard should, therefore, be paid to the mere decision of its being a simple form of the disease; but where the general excitement runs high, it will be prudent to adopt a more active antiphlogistic treatment, and to regulate it in such a manner as to restrain the phlogistic tendency without interfering too much with the regular, and we may presume necessary excitement of the heart and arteries. Although it may be true, nay, most assuredly is true, that the "nimia diligentia medici" has done more harm in simple scarlatina than the disease itself, yet the intelligent and experienced practitioner has a safe and a sure guide in the grade of the existing symptoms, to direct him in the application of antiphlogistic measures.

It is moreover to be observed, that in the onset of the disease, it is not always in our power to decide satisfactorily whether its subsequent course will be simple or complicated, or severe and dangerous. However mild, therefore, the general

* Specielle Thérapie, bd. ii. p. 440.

† Gregory's Elements of the Theory and Practice of Physic, vol. i. p. 244.

character of the prevailing epidemic may be, it will be proper, whenever we are called to a case during the forming stage, attended with considerable lassitude and oppression, paleness of the face and skin, some headache and nausea, to commence the treatment as if the disease were about assuming an aggravated character. An emetic will, under such circumstances, frequently do much good by removing internal venous congestions; and after its operation, a brisk mercurial purge may be given with advantage. In cases attended with considerable affection of the head during the forming stage, Dr. Armstrong advises the use of the warm bath strongly impregnated with salt. "This practice," he says, "assisted by a brisk purgative, will in general give immediate relief, and contribute powerfully to moderate the subsequent reaction. When the subsequent febrile excitement becomes strongly developed, it should be moderated by purgatives, tepid effusions, cooling drinks, rest, ventilation, and some of the milder diaphoretic remedies—such as spiritus mindereri, sweet spirits of nitre, or small doses of nitre and antimony."*

In the *anginose* form of the disease, a much more energetic course of treatment is requisite. Almost all writers agree in recommending the use of emetics in the beginning of this, as well indeed as in the other varieties of scarlatina. The earlier they are resorted to, the more beneficial, in general, will be their effects; and it is particularly in the forming stage, or at the very onset of the febrile excitement, that they may be employed with decided usefulness.† When given at this early period, they frequently moderate the whole subsequent course of the disease, and in some instances almost completely break up the train of morbid actions. They have indeed been recommended throughout the whole course of the disease, (Withering,) but general experience goes to show that the commencement of the disease is the only proper period for their employment. The good effects of an emetic, in the beginning of the disease, depend, probably, chiefly on the centrifugal direction which active vomiting communicates to the circulation, and thereby obviating internal congestions and secondary inflammations; and perhaps, also, by weakening the morbid sympathies established by the cause of the disease.

Purgatives have of late years been strongly recommended in this affection, and they are, without doubt, often highly useful, although there formerly existed much prejudice against their employment. The utility of this class of remedies in scarlatina is particularly insisted on by Dr. Hamilton;‡ and all modern writers speak favorably of this practice. My own experience, though limited in this variety of the disease, has strongly impressed me with the utility of moderate purgation in this affection, and with the exception of an antimonial emetic in the commencement, I have in most instances confined myself almost entirely to the employment of aperients, with cooling applications to the surface, an antiphlogistic regimen, and the local applications to be mentioned hereafter. The judicious employment of laxatives in the early periods of the disease, is the most effectual measure for preventing the occurrence of colliquative diarrhœa in the latter stage—an occurrence which is always attended with danger. It is by no means necessary, or as a general rule, even proper, to use active purges. From three to four evacuations in the course of twenty-four hours are sufficient to procure all

* Armstrong. Treatise on Scarlatina, Measles, &c.

† Numerous authorities, of great weight, might be quoted in evidence of the good effects of emetics in this disease. They are recommended by Tissot, (Avis au Peuple;) Stoll, (Ratio Medend., tom. ii. p. 248;) Withering, (Account of Scarlet Fever and Sore Throat, &c., as it appeared at Birmingham in 1773, and London in 1799, p. 300;) Steiglitz, (Versuch einer prüfung und verbesserung der yezt gewöhnlichen behandlungsart des scharlachfiebers, p. 241;) Richter, (Specielle Thérapie, bd. ii. p. 480;) Reil, (Fieberlehre, tom. v. p. 166;) Armstrong, (on Scarlet Fever, &c.;) Rush, (Medical Inquiries.)

‡ Treatise on Purgatives.

the advantages which purgatives can afford,* unless cerebral congestion exists, when active cartharsis will be very proper.†

With regard to the employment of antimonials and the usual diaphoretic antiphlogistics, experience does not furnish us with any satisfactory evidence of their usefulness. "In truth," says Dr. Bateman, "the temperature is too high to admit of a diaphoresis; and the only safe and effectual method of producing this effect, consists in reducing the heat of the surface *by the application of external cold*.‡ Richter, nevertheless, speaks favorably of the internal employment of the muriate of ammonia, when the fever is strong, after the bowels have been regularly evacuated.§ It should be given in union with tart. antimon. in the way directed at p. 100. If, notwithstanding the use of purgatives, and the other remedies already mentioned, the inflammatory condition increases, and the patient becomes anxious and very restless, the use of diluted sulphuric acid, in large and frequent doses, is, according to the experience of Steiglitz, a valuable remedy. (*Abhandl. fur Pract. Arzte.* b. xxii. p. 307.) The application of cold water to the surface of the body cannot be too strongly recommended in the higher grades of this affection. "We are possessed of no physical agent," says Bateman, "as far as my experience has taught me, (not excepting even the use of blood-letting in acute inflammation,) by which the functions of the animal economy are controlled with so much certainty, safety and promptitude as by the application of cold water to the skin, under the augmented heat of scarlatina and of some other fevers. This expedient combines in itself all the medicinal properties which are indicated in this state of disease, and which we should scarcely *à priori* expect it to possess, for it is not only the most effectual *febrifuge* (the 'febrifugum magnum,' as a reverend author—Dr. Hancoke—long ago called it), but it is in fact the only *sudorific* or *anodyne* which will not disappoint the expectation of the practitioner under these circumstances. I have had the satisfaction, in numerous instances, of witnessing the immediate improvement of the symptoms, and the rapid change in the countenance of the patient, produced by washing the skin. Invariably, in the course of a few minutes, the pulse has been diminished in frequency, the thirst abated, the tongue has become moist, a general free perspiration has broken forth, the skin has become soft and cool, and the eyes have brightened; and these indications of relief have been speedily followed by a calm refreshing sleep.‖ The only precaution that it is necessary to observe in the application of

* Bateman, Gregory, Richter, Reil, Willan. Dr. Armstrong, however, recommends active purges in preference to the milder articles of this class, in the anginose variety of the disease.

† Rhubarb and calomel; rhubarb and soda in equal parts; calomel with small portions of antimonial powder, (Willan;) calomel, followed by a small dose of magnesia; small portions of the sulphate of soda or magnesia; an occasional dose of two or three grains of calomel, with the daily use of a dose of castor oil, or the administration of laxative enemata, may be used for this purpose.

‡ [Cool air and cold water are no doubt worth all the other remedies in scarlatina. I always make it a rule to take my patients out of stove or furnace-heated apartments; and in the coldest weather, allow only a wood fire in a wide-throated chimney.—Mc.]

§ Specielle Thérapie, b. ii. p. 490.

‖ [My learned friend, Dr. Samuel Jackson, formerly of Northumberland, but now a distinguished practitioner in this city, has kindly furnished me with the following note in relation to his experience with ice in scarlatina. Its excellence and practical utility will render it unnecessary to apologize for its length, and I therefore will print it entire.

"In the autumn of 1832 and the following winter, the scarlatina, in form of cynanche maligna, ravaged the country north-west of Northumberland, and proved mortal to whole families. There was seldom any *exanthema*, the whole disease centering in the fauces, and running quickly into mortification. What was the treatment I never fully ascertained; but blisters were often applied to the throat, and not unfrequently they produced mortification.

"In November, 1832, the disease, in its progress to the north-east, reached Lewisburgh and Milton, eight and twelve miles to the north-west of Northumberland, and brought terror and dismay into every family. My friend Dr. Vanvalzah, of Lewisburgh, sent for me to visit his son and other cases in the town. The disease appeared as a violent inflammation passing rapidly into sphacelus. A few were saved in the region of these towns by capsicum gargles and quinine as a general tonic, but the majority of cases were lost.

cold water to the surface in this and other febrile diseases, is to see that the skin is above the natural temperature, and dry, and that no feeling of chilliness be present. When the arterial excitement is vehement, and the temperature of the surface intense, the water should be applied by pouring or dashing it over the body; but where this mode of using it is impracticable, or objected to on the part

"In the following spring the disease reached Northumberland, and the first patient was my own child, whose case I have recorded in the *Amer. Journ. of Med. Sciences* for May 1833. Her fever was plainly of the typhous character, with a very rapid pulse, hot skin, distressed countenance, the fauces severely inflamed from the first, and without pain or difficulty of deglutition. I bled her to ℥viii. in the evening paroxysm, evacuated her stomach and bowels by tart. emet. and calomel; for a gargle, a solution of sac. sat. was used. On the second day the cineritious spots appeared, and hence the gargle of lead was changed for one of nit. argent. 24 grs. to water ℥i. She craved cold water very ardently, and this fact associated *ice* with the fiery inflammation of the fauces. She was desired to hold lumps of ice in her mouth as far back as possible, and to swallow the solution; lest she might let the undissolved lump pass into the stomach, it was pounded and enclosed in a gauze bag. The good effects were immediate, surprising, incredible, and almost divine. Within two or three hours the pulse was reduced from 150 to 120; the circumscribed crimson disappeared from her cheeks; the extremities became warm in proportion as the feet and stomach were cooled; the whole aspect was changed from that of a typhous to that of a common fever. No other remedy was used; the cineritious spots and fiery inflammation soon disappeared under the continual use of ice, without any tonic, local or general.

"Many cases soon occurred in Northumberland and its vicinity, which were all treated in the same way and with entire success. The people had been so alarmed by reports from the northwest, that they lost no time in applying where they had heard of such certain relief. Now was the danger merely a phantom. A robust boy, four years old, son of William Zeelif, died to the surprise of his friends, and without medical aid; I was then called to the rest of the family, four miles in the country, where I found the mother, her sister, and three children, the youngest six months old, all very ill. Here was certainly a mortal disease, as it had already destroyed one of the family, but all the rest recovered under the use of ice and chloride of soda. Mrs. Schuyler, of Northumberland, lost one of her children of the disease, at Muncy, twenty seven miles north of Northumberland. Here neither ice nor chloride was used; but when she returned home, her other three children were severely attacked, and they all recovered under the use of ice, without any other application to the throat. About the same time, Daniel Gossler lost two children, under the care of a hospital physician; the others recovered under the new remedy administered by me.

"So well known had I become in the treatment of this disease, that Mr. Hardman Philips, of Phillipsburg, ninety-six miles from Northumberland, losing his two little sons by cynanche maligna, sent his only remaining child to my house that he might have the disease under my care. She arrived in her father's carriage by forced journeys in about twenty-four hours, while her parents remained to bury her brother. In two days she took the disease in my house and happily recovered.

"The following year I wrote Dr. Hays a letter, detailing my further experience. This was published in No. 24 of the *Amer. Journ. of Med. Sciences* for August, 1833, and from it I will copy a few observations. 'I had now used the ice in more than forty cases of severe cynanche maligna, and found it highly useful; nay, I am almost certain that without it, more than half the number would have been lost. Drs. Magill, of Danville—Boskins, of Selinsgrove—and Lotz, of New Berlin, have all used it with the happiest effects, and these are truly respectable men both in morals and in medicine. So necessary had the remedy become in the hands of Dr. Lotz, that Mr. Laschelles, a benevolent gentleman of New Berlin, refused the use of his ice even to his own family, reserving it all for the sick; and Dr. Lotz frequently carried it with him in his visits to the country. The patient ought to hold the ice almost constantly in his mouth and swallow the solution; and if he be not old enough to rest on his guard against swallowing the undissolved lump, it must be enclosed in a gauze bag. If the fever be very high, he may swallow small portions of it finely powdered. If he be too young to manage ice, we inject the solution of it into his throat, and give him the powdered ice to swallow. The patient and the nurses can have very little rest unless it be a mild case that may not require uninterrupted repression and sedation; for they must not lose during the night what they have gained during the preceding day. If the inflammation is rather lively, the gangrene small, and there is yet abundant vivacity in the system, no other local remedy is needed. The sloughs will gradually and surprisingly disappear as the general inflammation of the fauces abates. When the gangrenous tendency begins to predominate, we have found the chloride of soda a noble remedy. In those cases attended with debility, whether with or without much gangrene, ice cannot be used, and our dependence has been on chloride of soda and capsicum alternately used.

"'Every case of cynanche tonsillaris, or simple inflammatory sore throat, which has fallen under our care the last twelve months, has been treated with ice after bleeding, and with great

of the patient or his friends, we may obtain our object by washing or sponging the skin with cold water, or vinegar and water, and this should be repeated every hour or two, until the desired reduction of the heat and arterial excitement is effected. Dr. Armstrong observes, that as the disease advances, instead of cold, *tepid* affusions are to be used; and, as a general rule, he thinks it most prudent to resort to the latter after the third day of the stage of excitement. In this, however, we must be governed by the degree of arterial excitement, and of the heat of the surface present; for cold water may be safely and beneficially applied at any period of the disease, provided the skin be very hot and dry.* (Dr. Stranger.) Purgatives and cold affusions may be employed conjointly. Armstrong, indeed, asserts that when thus used they do more good than when employed separately, more especially during the first three days of the stage of excitement; and several instances have come under my own observation which strongly favor this opinion. *Blisters* may sometimes be beneficially used during the first two or three days of the stage of excitement. When the tonsils are much inflamed and swollen, so as to render swallowing difficult, the application of a blister to the throat will often afford considerable relief. This practice is particularly recommended by Willan, Heberden, and Rush.

When the disease is complicated with visceral inflammation, little or no relief will be obtained from the application either of cold or tepid water, to the surface; and Armstrong observes, that where these measures, in conjunction with purgatives, do not afford any advantage, the practitioner may be sure that there is some latent inflammation present. When this is the case, and collapse is not approaching, recourse must be had to sinapisms, blisters, small general or topical abstractions of blood. Should there be manifestations of much vascular irritation, or of incipient inflammation of the brain—that is, should the face become flushed and turgid, with severe pulsating pain in the head, more or less delirium, intolerance of light, and a disposition to somnolency, the patient must be kept in a cool situation with his head elevated, *and blood drawn according to the state of the pulse*,† an active purgative administered, warm fomentations, or sinapisms applied to the feet, and cold water to the head, and cups applied to the temples, or blisters to the back of the neck, provided always that

advantage; and in one case of severe aphthous sore throat, that of Dr. Robbins, of Sunbury, he assured me it was the most comfortable thing he had ever experienced.

"'During the subsequent five years that I practised in Northumberland, the disease prevailed, but now there was the regular exanthema, and the throat was less violently affected. Still the ice was often necessary, and many who are now alive would have perished under any other known remedies.

"'In the 43d No. of the *Amer. Journ. of Med. Sciences* for May 1838, when I had removed to Philadelphia, I published my further experience, and gave the testimony of Drs. Magill, Lotz, Rodrigue, and my pupil Mr. Pleasants, now physician in West Philadelphia. Rodrigue says, "*My chief dependence was on ice or iced water.*" Dr. Lotz says, "*It is my decided conviction that ice is the most useful article in the whole catalogue of remedies. Not unfrequently, I wrapped large pieces in flannel and tied them to my saddle for the use of my country patients.*" Dr. Magill says, "*In the early stage, it has certainly effected more in my hands than all other remedies.*" Dr. Pleasants, in his thesis, says, "*Here, luckily for the inhabitants* (of Northumberland), *the career of their enemy was arrested—here was it to encounter a powerful, a successful opponent.*"'

"But to conclude, let us assure the reader that we are not proposing exclusive and infallible remedies in the manner of quacks. A distinguished physician of this city said to me, 'our patients will die notwithstanding your ice.' True, there are many advanced cases that no remedy will ever control; there will always be found some cases so vehement in the onset, that congestions with convulsions will quickly supervene; and there will often occur some patients so young and so unmanageable, as to frustrate continually our most resolute efforts.

"As to the use of old remedies, I would gladly say many things, but this note is already too long; and I would beg to refer the reader to what I have said in the *Amer. Journ. of Med. Sciences*, vol. xxii."—Mc.]

* Willan on Cutaneous Diseases—note at p. 360.

† Armstrong; Marcus, (Specielle Thérapie, tom. iii. p. 272;) Lorry, (Hist. de la Soc. Roy. de Méd., t. ii.;) P. Frank, (de Curand. Homin. Morbis;) Rush, Burserius, (Institut. Med. Pract., vol. ii. p. 72;) Heim, (Horn's Archiv. fur Medic. Erfahr., vol. iv. h. 1, p. 150.) Richter and other eminent authorities may be adduced in favor of prompt blood-letting in such cases.

collapse is not at hand. Unfortunately, however, the supervention of internal visceral inflammations in this affection is almost always speedily followed by *collapse;* and in this state sanguineous and other evacuations are entirely out of the question. Dr. Armstrong observes, "that in such examples the question is simply this—whether there is greater danger to be apprehended from the inflammation or from the depletion?" Visceral inflammation, he says, almost invariably terminates fatally, but depletion produces debility only, and debility is rarely the cause of death. He is, therefore, of opinion, that an attempt ought to be made to arrest the inflammation by depletion, even in the stage of collapse, wherever it may be seated. It is true, that debility is, perhaps, rarely the cause of death; but it may be asked, why is visceral inflammation so fatal in such cases? The answer would seem to be—*because it is connected with universal debility;* and the clear inference is, that whatever tends to augment this debility or prostration, must tend also to hasten its fatal termination. Before we adopt so desperate a practice, we should reflect that a small bleeding cannot materially influence or reduce the internal inflammation, and a large one must inevitably precipitate the patient into fatal prostration. Such cases are, indeed, exceedingly perplexing, for the remedies which are best and almost alone calculated to remove the inflammation, are also the most certain to increase the prostration. When the brain is the seat of the inflammation, we may apply fomentations to the feet, dry cups to the temples and shaven scalp, and exhibit active purgatives conjointly with carbonate of ammonia or camphor. In other visceral inflammations attended with collapse, I should be disposed to resort to calomel and opium, with dry cupping and large fomenting cataplasms over the region of the affected part. Blisters in such cases are almost as hazardous as bleeding. They produce much general irritation, and the blistered part often becomes gangrenous.

Malignant scarlatina, though generally strongly phlogistic in its commencement, passes so rapidly into a low and typhous state, that formerly physicians placed almost their entire dependence in its treatment on the active and early employment of bark, wine, and other stimulating and tonic remedies. "These remedies," says Armstrong, "so forcibly, so indiscriminately, and so fatally recommended by numerous authors, were once the means upon which, unfortunately, I relied for the cure of this modification of scarlet fever; and from repeated trials of them, I can truly affirm that they are the most pernicious in the first stage, and the most destructive in the second." However rapidly this form of the disease may pass into a low and malignant state, its onset is often characterized by highly inflammatory symptoms. The attack is vehement, and the febrile excitement at first tumultuous, tending rapidly to consume the vital energies; and in proportion to the violence of this excited, though transient stage, will be the tendency of the disease to assume a putrid character. It is, therefore, of the utmost importance to break down promptly, by energetic measures, the initial febrile commotion. I have already stated that the exhibition of an emetic, followed by a brisk purgative, in the chilly or forming stage, is often as beneficial in this as in the other modifications of the disease; and the treatment should always commence with these remedies, if we are called at a sufficiently early period. If, after the operation of these evacuants, the stage of excitement begins with violent symptoms—such as intense heat of the skin; severe headache; delirium; and a frequent, quick, and tense pulse; blood should be promptly and efficiently abstracted. (Burserius, Lorry, Armstrong.) As this stage is generally but short, it is of great importance to draw blood at once in its onset, to the extent of producing a very decided impression on the system; or, as Armstrong advises, until syncope approaches. By one such bleeding, and the brisk operation of a purgative, the violence of the disease is often broken down, and its subsequent course rendered milder and more manageable. It must not be forgotten, however, that these active depletory measures must be entirely restricted to the *early period* of the stage of excitement; for when collapse is approaching, bleeding is wholly out of the question. (Armstrong.) Purgatives are always

proper during the stage of excitement in every variety of scarlatina. *Calomel* has been particularly recommended for this purpose both in the mild and the malignant forms of the disease.* Dr. Rush gave this article throughout the whole course of the disease. Seelig† speaks in high terms of a combination of calomel, precipitated sulphuret of antimony, and tart. antimony, according to the formula below,‡ a combination which is said to be particularly useful as a gentle laxative, and antiphlogistic alterative in the present variety of the disease. In conjunction with purgatives we may use the *warm* bath with a prospect of advantage, more especially in cases attended with internal inflammation.

When a prompt and energetic antiphlogistic treatment is employed in the onset of the inflammatory form of malignant scarlatina, the system seldom sinks into a very low state of collapse; and when this stage supervenes, after such a treatment in the commencement of the disease, we may, in general, give sufficient support to the vital powers by wine-whey, weak solutions of ammonia, infusion of serpentaria, a milk diet, quietness, and proper ventilation. (Armstrong.) When, from an inefficient or improper treatment in the beginning, or from a peculiar violence of the disease, great and universal collapse ensues, (which is indeed but too frequently the result, both in the inflammatory and congestive modifications of malignant scarlatina,) recourse must be had to a more active stimulating and tonic treatment. The carbonate of ammonia in frequent and active doses ;§ wine, camphor and opium where the brain is not particularly affected; infusion of serpentaria, with strong doses of elixir of vitriol, quinine and capsicum, are the remedies upon which our dependence must be placed. The *capsicum* appears to be a particularly valuable exciting remedy in this variety of the disease. This article was first employed in malignant scarlatina by Dr. Stephens,‖ in a very fatal epidemic which prevailed at St. Christopher's (West Indies) in 1787, and it has since received the decided approbation of many eminent practitioners.¶ The manner of employing it is as follows: take two tablespoonfuls of small red pepper, or three teaspoonfuls of common Cayenne pepper, and two teaspoonfuls of fine salt; beat them into a paste, and pour upon them half a pint of boiling water; this is to be strained, and half a pint of good vinegar added to it. Of this liquor, when cold, a tablespoonful is to be taken every half hour by an adult, and the throat should be frequently gargled with it. Stephens asserts that he employed this remedy in about four hundred cases, and with surprising success. The ulcers in the fauces soon cast off their sloughs and commenced to heal, a general pleasant warmth was diffused throughout the system, and the vital powers speedily resumed a more active condition. Malfatti** speaks very favorably of the flowers of arnica; and Stieglitz employed them with much advantage in the sinking stage of the complaint. Reil strongly recommends large doses of musk, particularly where much restlessness and nervous irritation exist. Stimu-

* "It is somewhat remarkable," says Armstrong, "that calomel, though given in large and frequent doses, will hardly ever produce ptyalism in scarlatina." He states that he has frequently given from six to eight grains of this article to children, twice, thrice, and even four times daily, without having, in a single instance, known it to produce salivation. He considers it the best purgative in every modification of this disease.

† Hufeland's Journal, bd. 16, 1 st. Reil's Fieberlehre, vol. v. p. 177.

‡ ℞.—Calomel ℈i.
Sulphuret. antimon. præcipit. grs. ii.
Tart. antimon. gr. i.—M. Divide into twenty equal parts. Dose—one part to be taken every three or four hours by adults.

§ Peart asserts that he has been so successful with the use of carbonate of ammonia, that out of three hundred cases in which he employed it, he lost but three patients. This, however, may well be deemed *ultra rem tendere* in commendation of this remedy; although, unquestionably, a highly useful medicine in the stage of collapse, not only of this but of all forms of disease.—*Practical Information on the Malignant Scarlet Fever*, &c. By E. Peart, London, 1802.

‖ Edinburgh Medical Commentaries, Dec. 2, vol. ii. p. 75.

¶ Cappel, loc. cit, p. 276. Kreisig, loc. cit., p. 113, and Seibert, Archiv. fur die Volksarzneikunde, p. 129.—As quoted by Reil, loc. cit., vol. v. p. 175.

** Hufeland's Journal, bd. 12, st. 120.

lating frictions with brandy, camphorated spirits, or tincture of capsicum. have also been found useful in the collapse of this disease. (Reil, Stieglitz.) In the stage of excitement, cooling drinks acidulated with lemon-juice, or the sulphuric or muriatic acids, should be freely allowed; but during the subsequent stages, infusions of sage, balm, or catnip, with sulphuric acid, are more appropriate. In relation to the *congestive modification of the disease*, it is not necessary to say much in this place, for the principles of treatment are always the same in all congestive states of febrile diseases, and what has already been said of the treatment of congestive typhus, applies in all respects to the present malady when it assumes this modification. When the disease commences and proceeds under symptoms of oppressive internal venous congestions, our first efforts must be to recall the circulation to the surface, and to relieve the internal organs; and for this purpose, our reliance must be placed on the assiduous use of frictions, and warm and stimulating applications to the surface; large doses of calomel, (20 grains;) stimulating enemata; warm and gently stimulating ptisans, and small doses of camphor where the stomach is irritable. Having elicited a moderate degree of febrile reaction by these means, it will in general be most prudent to commence at once with the use of some of the milder stimulating remedies, such as infusions of serpentaria, calamus, wine-whey, or small doses of the carbonate of ammonia; and as the disease advances and the signs of prostration increase, the more active exciting remedies already mentioned must be employed, with an energy corresponding to the degree of prostration present.

Local treatment.—Various local applications have been recommended for the purpose of moderating the tendency to ulceration in the fauces, or of checking the progress of the ulcers, favoring the separation of the sloughs, and disposing them to heal. Willan strongly recommends fumigation with nitrous gas; others speak favorably of the application of a weak solution of nitrate of silver* to the sores; and some recommend the sulphate of copper—all of which may, no doubt, be used with benefit. Various gargles also have been employed, and of these the infusion of Cayenne pepper, mentioned above, is perhaps the best. I have seen much good done in putrid sore throat by a strong infusion of the root of *baptisia tinctoria*, (indigo plant,) and I have also employed the *black-wash*, (calomel gr. xx, lime-water ℥viii,) with excellent effect in several cases of this kind. Barley-water, acidulated with sulphuric or muriatic acid, forms an excellent gargle for washing off the acrid matter from the inflamed and ulcerated fauces. Dr. Barth has employed the *pyroligneous acid* for this purpose with signal advantage. He uses half an ounce of the acid with five ounces of water and an ounce of syrup; with which the throat is to be gargled every half hour.† Where there is no visceral inflammation, or collapse has not supervened in the anginose variety, a gentle emetic will often have an excellent effect in cleansing the sores and clearing the fauces from viscid and offensive matter. "Emetics," says Armstrong, "are the best gargles, where the throat is much obstructed from an accumulation of tenacious mucus; their operation effectually dislodges that morbid secretion for a time; often greatly relieves the respiration; improves the appearance of the ulcers; and they may be repeated where no abdominal inflammation exists, at any time during the continuance of the fever, whenever the respiration and deglutition become much impeded by an accumulation of phlegm."

During convalescence from scarlatina, which is generally very tedious, a light and nourishing diet should be enjoined, and the patient carefully guarded against the influence of cold and variable weather. When there are considerable debility and relaxation present, mild tonic and cordial remedies should be prescribed, such as weak infusions of serpentaria, colomba, gentian, or calamus aromaticus, with some of the mineral acids, particularly the sulphuric. In some cases, more

* [I generally apply the solid lunar caustic over the surface of the tonsils so as to coagulate the mucus every day in all severe cases of malignant scarlatina.—Mc.]

† Rust's Magazine, vol. xxvii. No. 1, 1828.

or less general irritation remains during the early part of this period. The pulse is quick and frequent, the skin pale and dry, the bowels inactive, the appetite weak, and the sleep disturbed. Here tonics and cordials are entirely out of place. Recourse must be had to mild aperients, diaphoretics, warm bathing, and a simple and unirritating diet. Small doses of calomel in union with ipecacuanha, (one grain of the former to two of the latter,) three or four times daily; the muriate of ammonia; digitalis with the nitrate of potash; spiritus mindereri with minute portions of tartar emetic; infusion of eupatorium perfoliatum, or of elder blossoms; acidulated diluents, &c., will generally answer well in cases of this kind. In all instances, the patient should be particularly careful to avoid taking cold; and as the susceptibility to the injurious effects of low and variable temperature is always especially great immediately after an attack of this disease, he should remain within doors during the whole period of convalescence, unless the weather be mild or warm.

I have already mentioned dropsy as a very common consequence of every modification of scarlatina. This tendency to anasarcous effusion is generally ascribed to improper treatment during the febrile stage of the disease, or to errors in diet, or imprudent exposure to cold during the periods of desquamation or convalescence. That these causes have a particular influence in this respect cannot be doubted; but as dropsy sometimes occurs after the most judicious and careful management in all these respects, it would seem that the original disease itself tends ultimately to effusions of this kind, perhaps from not having passed regularly and completely through its specific train of morbid actions—the dropsy or some other disorder appearing afterwards as a complemental affection.* These dropsical affections are seldom either obstinate in their course or dangerous. In most instances of dropsy from this cause, the general state of the system is manifestly phlogistic. The pulse is quick, sharp, tense, frequent, and sometimes full; the skin dry, harsh, and preternaturally warm; the urine small in quantity, high-colored, and charged with coagulable serum; and the bowels generally torpid. Here an antiphlogistic treatment is evidently indicated. Richter strongly recommends blood-letting, and other eminent writers (and amongst these several recent ones) insist with equal emphasis on the propriety of this measure. Burserius gives an account of an epidemic scarlatina which prevailed at Florence in 1717. The disease yielded readily under the plan of treatment recommended by Sydenham. After the twentieth day from the commencement of convalescence, many became affected with a sense of weight in the chest, cough, œdema of the face and on the forepart of the neck. Fever soon followed; the dropsical effusion increased until it became general; the breast felt sore; the abdomen distended and painful; the urine very small in quantity, and in some instances almost entirely suppressed. All who took diuretics died. On dissection, the lungs, kidneys and intestines were found inflamed. Blood-letting was now freely resorted to in the cases which occurred, and the resut was uniformly favorable.†

Gregory seems to hesitate concerning the propriety of venesection in hydropic affections after scarlatina. He states that he has "met with several cases which appeared to indicate bleeding and purging, but which resisted both, and ultimately yielded to bark and aromatic confection." My own experience leads me to place confidence in this measure, where the diathesis is evidently inflammatory; not, indeed, as a sole or even a principal curative means, but as an important preparatory step to the employment of diuretics, purgatives and diaphoretics. The best diuretic in cases of this kind is digitalis, either alone or in union with small portions of calomel and nitrate of potash. As a purgative and diuretic, I have derived much advantage in this and other varieties of phlogistic dropsy

* Reil, loc. cit., vol. v. p. 186.

† Burserius, Institutions Med. Pract., vol. ii. p. 81.

from the following combination.* Small doses of tart. antimon., dissolved in a large portion of some mucilaginous diluent, may also be used with advantage. Richter recommends large doses of calomel, from five to ten grains daily, to children. The occasional use of the tepid bath will often prove beneficial, and the mildest farinaceous diet, with cooling acidulated drinks, and quietude, should be enjoined. Sometimes these dropsical effusions are entirely without any febrile irritation, the system being relaxed, torpid, and leucophlegmatic;—the *hydrops frigidus* of the German writers. (Reil.) According to Richter, "the principal remedy, in cases of this kind, is calomel in doses sufficiently large to evacuate the bowels freely."† The cinchona bark, and the various medicinal preparations of iron, particularly the black sulphuret, are often decidedly beneficial in this form of the disease. Among the diuretics, squill, spirits of turpentine,‡ and the tincture of cantharidis, have been especially recommended. (Hufeland, Bucholz.) The following mixture is said to have done much good in such cases.§

Prophylactic measures.—In Germany, and in France, many statements have been published which would seem to prove that the *belladonna*, when regularly taken by those who are exposed to the contagion of the disease, will effectually protect them from the infection. Hahnemann, the author of the homœopathic doctrine, first introduced this narcotic as a preventive of scarlatina, and in conformity to his views, he prescribes it in what may be called *infinitesimal doses.* He gives but forty drops in seventy-two hours, of a solution of which one drop contains no more than the twenty-millionth part of a grain of the extract! However incredulous we may be in relation to the efficacy of such doses, we are not without respectable authorities in favor of the prophylactic powers of this article when given in small doses.‖ Berndt asserts, that he gave it with unequivocal advantage in this respect. Dr. Koreff, of Berlin, found it to protect persons completely against this disease, when taken for eight or ten days before they were exposed to its contagion. Three grains of the extract are to be dissolved in an ounce of cinnamon water, and given in doses of from two to three

* ℞.—Crem. tart. ℥i.
P. sulphat. potassæ ʒiii.
P. scillæ ʒii.
Tart. antimon. gr. iss.—M. S. Give from twenty to thirty grains four or five times daily to an adult.

† Kreisig speaks equally favorably of calomel in this and other morbid consequences of scarlet fever. "Against the sequelæ of scarlatina," he says, "the powers of calomel are great, and cannot be too highly praised."—*Abhandl. über das Sharlachsfieber*, &c., p. 107.

‡ ℞.—Spir. terebinth. ℥i.
Tinct. opii gtt l.—M. S. From ten to twenty drops may be given three times daily to children from five to ten years old.

§ ℞.—P. cinchon. ℥ss.
Aq. fervent. ℥xii. coque ad reman. ℥vi. dein adde,
Rad. polygal. seneg. ʒii.
Fol. digitalis ℈i. cola, dein adde,
Spir. nitri dulc. ʒii.
Syrup. cort. aurant. ℥ss.—M. S. Take from a tea to a tablespoonful every two hours, according to the age of the patient.

‖ [After a few apparently successful trials, Dr. Eberle was once induced to believe in the prophylactic virtues of the belladonna in this disease. But a continuance of his experiments soon convinced him of the utter insignificance of the remedy, and long before he left this city for Cincinnati, he dismissed all confidence in this, his sole concession to the claims of homœopathy. A brother practitioner, in the city of New York, had boasted before him that he never failed in deriving complete protection from the belladonna; and also that he had always been able to cure every case of scarlatina, when developed in consequence of non-protection, by the same remedy. In a short time, however, we learned from the public prints, that the same physician had lost his three only children by the epidemic scarlatina of that year, in the course of three or four successive days. Notwithstanding these facts, I owe it in justice to the homœopathic gentleman, to say that there are several respectable medical men in this country who still have confidence in the curative as well as prophylactic powers of the remedy.—Mc.]

drops to children under one year old, and one drop more for every year above this age.*

Seclusion of the sick, free ventilation, frequent changes of the linen, and other similar precautions, have been found completely effectual in preventing the communication of the disease to other members of the family. It does not appear that the contagious miasm of this disease is capable of attaching itself to clothes like some of the other exanthematous contagions. The breath of patients in the malignant form of the disease is said to be powerfully infectious; and the same has been observed with regard to matter discharged from the fauces.

Sect. VI.—*Erysipelas—St. Anthony's Fire.*

Erysipelas is a febrile disease, attended with diffusive cutaneous inflammation on some part of the body, characterized by redness, burning heat, swelling, and vesication.

In the majority of instances, various symptoms of deranged health precede the appearance of the erysipelatous inflammation—such as lassitude; slight headache; loss of appetite; nausea; general depression; furred tongue; and a disagreeable feeling of weight in the epigastrium. These symptoms usually terminate in febrile reaction before the cutaneous inflammation commences; but in some instances the local and general affections come on simultaneously; and occasionally the inflammation appears before the febrile irritation is developed. Sydenham speaks of an erysipelas, in which the affection of the face preceded the fever.

The inflammation comes out in the form of an irregularly circumscribed stain or blotch, which soon spreads over a greater or less extent of the contiguous surface. When the inflammation is very superficial, the redness of the skin disappears, for a moment, on pressure being made with the point of the finger; but where the inflammation extends deeper, no white spot is left after pressure. Considerable burning and stinging pain, but neither pulsation nor tension, is felt in the inflamed part. Some degree of tumefaction always attends from the beginning, and increases, often to a very considerable extent, in the progress of the disease. After the inflammation has continued for an uncertain time, though usually about the third day, small vesicles, or blisters of various sizes, filled with a limpid or yellowish serum, make their appearance. On the succeeding day, and sometimes not until two or three days after, these vesicles break, and discharge a viscid fluid, which occasionally forms crusts or large scabs. When the inflammation is about terminating in resolution, which usually occurs between the fourth and sixth days, the redness of the affected part diminishes, and assumes a pale or brownish-yellow color; the swelling also begins to subside; the skin acquires a rough and rugose appearance; and, on the following day, desquamation takes place. The general or febrile symptoms commonly follow the progress of the local erysipelatous affection, both increasing and declining together; yet, in their respective grades of violence, there is often no direct proportion between them; the fever being sometimes severe, with but a moderate local inflammation, and *vice versâ*.

In some instances, the inflammation gradually travels along the skin, without increasing much in the extent of its surface, disappearing from the parts first affected, in proportion as it encroaches on the adjoining sound skin. La Motte gives the history of a case which commenced on the scalp, and in the course of three weeks, gradually traveled over the whole surface of the body.† Similar cases are related by other observers.‡ (Reil.) Occasionally, whilst it retains possession of the part first seized, it spreads more and more, until a large extent of skin, and in some rare instances, the whole surface of the body, is erysipelatous. Salmuth (cent. i. obser. 3) relates a case of universal erysipelas. Some-

* Ed. Med. and Surg. Journ., Jan. 1825.

† Chirurg. t. i., observ., p. 92.

‡ Ephem. Nat. Curios., dec. ii. ann. iii., ob. p. 171.

times the inflammation disappears from its original seat, and comes out on some other, and often remote part of the body.

Such are the general phenomena of erysipelas. It is subject, however, to several prominent modifications, exhibiting important peculiarities both in relation to the character of the local affection, and the nature of the attending fever.

The true seat of erysipelatous inflammation appears to be in the *cutis*, or the *dermoid* system generally; and in its simple and regular form, it is, in a great measure, if not wholly, confined to this structure. When the inflammation is very active, and extends itself to the subcutaneous and intermuscular cellular structure, it assumes somewhat of the character of common phlegmonous inflammation, constituting the *erysipelas phlegmonodes* of authors. This state of the disease is characterized by a decidedly synochal grade of fever; the pulse being hard, tense, and frequent; a vividly red appearance, and an extremely distressing burning heat and prickling pain of the inflamed part; a dry tongue, with urgent thirst; and a tendency to profuse sweats. The swelling usually commences about the second day of the fever; and in a few days more, small vesicles appear on the inflamed skin. When the disease tends to resolution, these vesicles break or subside about the fifth or sixth day; the redness assumes a yellowish hue; the tumefaction and fever gradually decline, and by the eighth day, the old cuticle begins to desquamate. Frequently, however, instead of taking a turn to resolution, the pain becomes throbbing, at the same time that the redness diminishes, and more or less extensive suppuration of the ordinary phlegmonous character takes place.

Sometimes the inflammation extends deeply into the cellular tissue, and appears to commence simultaneously with the external or dermoid affection. In cases of this kind, the pain is always extremely severe; the skin tense, and exceedingly painful on the slightest pressure; and the general phlogistic irritation vehement. "The termination, except from energetic treatment, is seldom in resolution; the suppuration, which takes place from the fifth to the seventh day, though sometimes sooner, is accompanied with irregular chills; the redness of the skin and the pain diminish, but the swelling increases; there is much doughiness, and the part remains in that state for some time. In some cases, the pus remains for a long time before an opening is formed in the skin to give it vent, but in general it escapes either by a natural or artificial orifice, mingled with shreds of gangrenous cellular tissue. In these cases, the course of the disease is ordinarily tedious; sinuses are formed; sometimes sloughing of the skin takes place to a considerable extent, and colliquative diarrhœa often carries off the patient, exhausted by the slow fever and great suppuration." (Cazenave.) In some instances where cellular inflammation and suppuration take place beneath aponeurotic membranes, the symptoms become still more violent and distressing. In cases of this kind, "violet spots appear on the inflamed skin about the second or third day; these spots increase rapidly, and become covered with vesications; finally, small eschars are formed, which gradually fall off, and convalescence takes place under a greater or less degree of suppuration."

This variety of the disease is sometimes attended with strong symptoms of disorder of the biliary system, constituting the *erysipelas phlegmonodes biliosum* of some of the continental writers. Although not an uncommon modification, it has been but little noticed by the English writers. Mr. Copeland Hutchinson is, I believe, the only one who has given a particular account of it in the English language. There is, generally, much bilious vomiting in the commencement of this variety of the disease, and throughout its whole course the symptoms of biliary disorder are very conspicuous; the tongue is covered with a brown fur; the tunica albuginea is tinged with bile; and the skin generally exhibits a more or less icterode hue. The fever is of the synochus grade, and suffers very distinct evening exacerbations and morning remissions. The urine is small in quantity, and highly charged with bile; and in many instances bilious diarrhœa attends.

Phlegmonous erysipelas may occur on any part of the body, but it most commonly appears on the extremities and face. Bateman says that it most frequently

occurs in the face; but Cazenave states that it is most frequently observed on the extremities, and this accords entirely with my own observations.

In some cases, the erysipelatous inflammation is early accompanied by an œdematous state of the affected part; and this is more particularly apt to be the case, when the disease attacks persons of a relaxed and leucophlegmatic habit, or in such as have suffered much from chronic disorders, or are habitually intemperate. It would seem that in cases of this kind, the capillary vessels of the cellular tissue are, at first, in a highly congested, but not inflamed condition, and that these vessels soon relieve themselves by pouring out serum into the cellular structure. This modification makes its attack more mildly, and is, upon the whole, less dangerous and distressing than the preceding variety; although sometimes attended with considerable danger when it attacks the face. The inflamed skin is pale, red, or yellowish-brown, and is attended with but a moderate degree of heat and burning pain. The tumefaction does not increase so rapidly as in the phlegmonous state of the disease, and exhibits a smooth and polished surface, and pits when pressure is made with the finger. The vesicles are very minute, numerous, and but little elevated. On the second or third day after their appearance, they break, and give rise to thin, dark-colored scabs. When the disease attacks the face, the swelling often becomes so great as to close the eyes, and render the whole face exceedingly bloated, giving it the appearance, as Willan observes, "of a bladder distended with water." In this case, too, considerable vomiting sometimes occurs at an early period, and in the height of the inflammation, delirium and coma occasionally supervene, and death takes place under symptoms of cerebral oppression. This modification of the disease is usually denominated *erysipelas œdematodes*.

When the disease occurs in weak and nervous individuals, it is apt to assume a typhoid character, and is generally accompanied with low delirium throughout the greater part of its course. In instances of this kind, the inflamed part is of a dark or livid color; the vesicles are not numerous but large, and frequently terminate in gangrenous ulceration. Suppuration and sloughing of the cellular tissue usually take place, "producing little caverns and sinuses, which contain an ill-conditioned pus. This constitutes what is termed by authors *erysipelas gangrenosum*. In the year 1716, gangrenous erysipelas prevailed epidemically at Toulouse; and a similar epidemic is said to have prevailed in France in 1830. (Reil.)

Infants are subject to a modification of erysipelas (*E. neonatorum*) of a very obstinate and dangerous character. It usually occurs soon after birth, and instances are related of children having been born with blotches of erysipelatous inflammation so far advanced as to exhibit vesication and spots of gangrene. (Richter, Bateman.) The inflammation almost always commences on the lower part of the body—particularly about the genitals, nates, and umbilicus, and gradually spreads over the abdomen, and along the back and inside of the thighs. In some instances, several parts are affected at the same time, without a confluence of the inflamed blotches. The inflammation begins by a small red spot, which rapidly spreads irregularly over a greater or less extent of the skin. The inflamed part swells considerably; is firm and extremely painful to the touch, and of a dark red or purplish color. Large but thinly scattered vesicles appear, having inflamed livid bases, tending often rapidly to sphacelus. The disposition to gangrene is, indeed, always very considerable in this variety of erysipelas, particularly on the abdomen; when it affects the extremities, ulcerative suppuration is apt to ensue. Symptoms of intestinal and hepatic disorder are scarcely ever wholly absent. The alvine discharges are usually frequent, painful, and grass-green; in some cases there is constipation, with colicky affections. A jaundiced appearance of the skin, aphtha in the mouth, and acid ejections from the stomach, are very common in this disease. Its course varies from about seven days to three weeks. When deep incisions are made into the affected parts after death, a large portion of thin serous fluid issues,* and the skin exhibits a

* Osiander. Denkwurdigkeiten, b. ii. st. 2, s. 370.—Neue Denkwurdigk., b. i. s. 56.

firmer and thicker structure than in the natural state. Meckel found the umbilical vein, together with the peritoneum, inflamed, and he was led, by this fact, to believe that inflammation of this vein, occasioned by rude management in cutting and tying the umbilical cord, constituted the primary disease. This opinion has since been adopted by many, but its correctness as yet is by no means established. (Reil, Fieberlehre, b. ii. kap. 5, s. 329.) Richter observes that this disease in its general character is never purely inflammatory, but always manifestly gastric and irritative.

There is another affection which appears to be very closely allied to the present one, if not in reality the same disease, and which is equally confined to new-born infants. This is the *induratio telæ cellularis*, an affection characterized by a peculiar hardening, consolidation, or induration of the cellular tissue. It is not often met with in private practice, but in some of the foundling hospitals of Europe it has been abundantly observed. The affected part becomes hard, incompressible, and tense; the skin so firmly adherent to the subjacent parts, that it cannot be pinched up, or in any way moved from its fixed position. Its color is violet, pale red, yellowish red, or yellow. It generally commences on the trunk, and gradually extends its circle, until, in some instances, the whole body becomes affected. The little patient cannot cry out; deglutition is often difficult, spasmodic, and occasionally impossible; the jaws are sometimes closed as in trismus; and in most cases, convulsive or tetanic spasms ultimately come on. Its course is always rapid—terminating often by the third day, and seldom continuing beyond the seventh. It is a most fatal malady. I have seen five or six cases, but no recovery. There is also an habitual and non-febrile form of erysipelas. It occurs in cachectic persons, in women of a leucophlegmatic habit laboring under menstrual irregularities, and especially in individuals affected with chronic visceral disease, *more particularly of the liver*. Habitual drunkards also are very liable to this form of the disease, no doubt from the hepatic disorder which is almost always ultimately produced by habitual intemperance.

Although erysipelatous inflammation most commonly terminates in resolution, yet suppuration and gangrene frequently occur in the more violent grades of the disease. There is something very peculiar, however, in erysipelatous suppuration, both with regard to the seat of this process and the character of the pus which is formed. It always commences in the subcutaneous cellular tissue, and the pus generated is very rarely thick and yellowish like that in common phlegmonous suppuration, but thin, grayish or whitish, somewhat acrid and sanious. The matter is never collected in circumscribed cavities: it travels along the cellular tissue, under the skin, and between the muscles until this structure (cellular) is almost entirely destroyed in the affected part. Small openings finally ulcerate through the skin, and the matter, mixed with shreds of sphacelated cellular membrane, is discharged. Through these orifices large portions of deadened cellular structure may be drawn, "resembling pieces of wet tow." I have, in two instances, known this tissue so completely destroyed in the forearm, that the skin hung loose like a bag round the muscles, and the muscles themselves were completely separated, as if they had been dissected from each other. Both cases terminated fatally. In instances of this kind that finally get well, the skin grows fast to the muscles, and even the muscles themselves adhere to each other, rendering their action very difficult, and sometimes destroying the free use of the limb entirely.

Erysipelas, of whatever variety it may be, is always more dangerous when it attacks the head than when it occurs on the body or the extremities. This arises chiefly from the brain being apt to become oppressed or inflamed in severe cases of the face. Instances occur, in which the inflammation passes down into the fauces and along the alimentary canal, giving rise to severe and exhausting diarrhœa. Visceral inflammations of various kinds have been known to supervene during the progress of severe erysipelatous affections. I have seen a case in which pneumonia came on during the height of the disease; and instances are

related, in which the inflammation extended along the vagina into the uterus, as well as along the urinary passages to the kidneys.* (Frank.) The brain, however, is by far the most frequently affected in this disease. Does this arise from metastasis of the external inflammation? This point has been much disputed. Cullen ascribes the cerebral affection to the mere extension of the inflammation from the external part to the brain. This I believe to be correct. I have seen at least half a dozen cases in which symptoms of cerebral inflammation came on; but in no instance was the external inflammation in the smallest degree lessened by this occurrence. It is from the state of the brain, when the disease attacks the face, that we chiefly collect the prognosis. When neither delirium nor coma supervenes, either before or during the presence of the inflammation, there is generally no cause to apprehend particular danger; but when these symptoms come on, the hazard is always great. I am by no means disposed to deny that erysipelas sometimes passes, by metastasis, from the external to internal parts—or perhaps, more correctly speaking, that visceral inflammation sometimes supervenes at the same time that the erysipelatous affection disappears. I have myself recently seen an instance of this kind. A lady became affected with erysipelas on both arms, occupying the whole surface from the hands to the elbows. On the third day the inflammation rapidly subsided, and on the following morning she was seized with alarming hæmoptysis. Richter observes that the *œdematous*, and what he calls *nervous*† modifications of erysipelas, are the most liable to pass upon internal organs.

What I have hitherto said, has reference chiefly to the local erysipelatous affection. In relation to the character of the attending fever, important diversities occur, which it may be proper to notice more particularly than has already been done.

The most common grade of erysipelatous fever is the *synochal*, or strictly inflammatory. In some instances, the fever, in its onset, manifests a typhoid tendency, but as soon as the inflammation appears, its synochal character becomes developed. More commonly, however, the fever begins at once in the character of a well-characterized synocha; and this is more particularly apt to be the case in the *phlegmonoid* variety of the disease. In nearly all instances in which the inflammation attacks the face, the attending fever is of this grade; and it is of course always more apt to assume this grade in the young, plethoric, and robust, than in aged, infirm, and relaxed individuals. When the fever is synochal, it always increases in violence when the inflammation appears.‡

Not unfrequently the attending fever is typhoid, *ab initio*, and throughout. This is most apt to be the case in weak, nervous, and irritable subjects, and particularly in those who are affected with derangement of the digestive organs. Cases of this kind are always much more dangerous than where the fever is of a more active grade; for they are equally liable to the supervention of internal inflammations, and the occurrence of gangrenous suppuration is much more common in the former than in the latter, and of course, the system less capable of sustaining the effects of the disease.

Typhous, or as it has been called, malignant erysipelas, has occasionally prevailed epidemically. De Haen and Bartholini mention epidemics of this kind, and I have already referred to the epidemic which prevailed at Toulouse in 1716, which is said to have been but little less fatal than the plague.§

Causes.—In relation to the causes of erysipelas, nothing very definite can be

* Reil, loc. cit., vol. ii. p. 372.

† He designates those cases by the term *nervous*, that are attended with a typhoid or typhous grade of fever. They are generally connected with manifest gastric derangements.

‡ [Erysipelas in this latitude often partakes of the intermittent type. In most cases the quinine and other tonics come in as the proper remedies after suitable evacuation.—Mc]

§ Hippocrates mentions an erysipelas which spread among the people, and proved exceedingly fatal. The whole arm, leg, &c, had their soft parts in some instances almost entirely destroyed by gangrenous ulceration.—*Van Swieten's Comment.*, vol. v. p. 181.

said. Some individuals appear to be constitutionally predisposed to this affection; and Richter supposes that this predisposition depends on a peculiarly irritable and delicate condition of the dermoid system. In some persons, bruises, wounds, and other local irritating causes, are particularly apt to give rise to erysipelatous inflammation, and this is more especially the case in injuries of the scalp. The inflammation which is produced by the recent leaves of the *rhus toxicodendron*, is strictly of an erysipelatous character. Individuals of a cachectic habit; the habitually intemperate in diet and spirituous drinks; the leucophlegmatic; and persons laboring under chronic visceral affections, particularly induration of the liver or spleen, or mesenteric glands, are most liable to this disease. Strong and sudden mental emotion has been known to produce erysipelas. Richter observes that he has known individuals who always became affected with erysipelas of the face, after they had been thrown into a violent fit of anger. (*Thérapie*, bd. ii. p. 210.) In some individuals, erysipelas returns periodically. (Reil.) These cases are generally slight, and soon go off; and are usually dependent on some disorder of the liver or alimentary canal. Erysipelas seems at times to depend on some peculiar atmospheric constitution or miasm, for it is only to a cause of this general character that we can ascribe its occasional epidemic prevalence. Some writers of eminence assert, that the disease is sometimes propagated by contagion; and there are many facts recorded which strongly favor this opinion. The disease has, for instance, been known to prevail to a great degree in certain wards of hospitals;* and Dr. Wells has brought forward some examples which occurred in private families, that appear to demonstrate its occasional contagious character.† Dr. Stevenson, also, has recorded some facts of a similar import.‡ Its occasional apparent contagious character in hospitals may depend, however, merely on a general depraved habit of body, produced by the foul air to which the inmates of hospitals are at times exposed from deficient cleanliness and ventilation. Bateman states that this disease has been banished from the Royal Infirmary of Edinburgh, by ventilation and other means of purification.

Erysipelas occurs sometimes in the course of fevers, apparently from a critical effort of the system to relieve itself from some internal irritation. I have lately witnessed an interesting example of this kind. A person was seized with fever of a remitting synochus form. The disease was attended with symptoms of much gastric and biliary derangement. It continued without any amendment for nearly two weeks. At last a violent erysipelatous inflammation occurred on the face, which, in the course of six days, subsided regularly, and left the patient in a state of convalescence. This disease appears also at times on the suppression of some habitual evacuation. I know a gentleman in this city, who has been affected, for thirty years past, with an extensive superficial ulceration on one of his legs. Whenever the ulcer becomes dry, which generally occurs several times during the year, either an erysipelatous inflammation occurs on the face or the forearms, or he is seized with a violent fit of asthma. On the application of a blister to the leg, these affections speedily go off.

Treatment.—With regard to the general treatment of this disease, it is obvious that it must be modified according to the character of the attending fever; and that a course of remedial management, which might be very proper in one modification of the malady, would probably be very injurious in another. When the fever is of a high grade of reaction, the treatment should be antiphlogistic. It is not, however, often necessary, even in cases of this kind, to make frequent and copious abstractions of blood—unless symptoms of cerebral inflammation super-

* "The occasional contagious character which erysipelas assumes, is well known to all who have paid any attention to the complaint in the wards of hospitals."—*Dr. Johnson, Med.-Chir. Rev.*, October, 1826, p. 404.

† Transactions of a Society for the Improvement of Medical and Chirurgical Knowledge, vol. ii., 1800. (Bateman.)

‡ Transact. of the Med.-Chir. Soc. of Edinburgh, vol. ii. art. ix.

vene, with an active state of the circulation. Under such circumstances, blood should be promptly and freely drawn, in order to relieve the brain. It does not appear, however, that any particular impression is often made on the progress of the erysipelatous affection itself—at least not on its obvious condition—by venesection; although unquestionably frequently very useful in obviating some of the unfavorable consequences of the inflammation. When the pulse is frequent, tense and hard, bleeding ought by all means to be practised, and carried to the extent that may be indicated by the state of the circulation, without any regard to the appearances or character of the local affection.

With regard to the propriety of local bleeding by leeches, very discrepant sentiments are expressed by authors. Willan, Thompson, Richter, and others, speak decidedly against this practice; and from what I have myself seen of it, there appears to be much foundation for rejecting it. In the only case in which I have employed leeches, several very obstinate ulcerations occurred, apparently in consequence of the leech-bites. Cazenave speaks favorably of this mode of depletion; but he very properly cautions against applying the leeches to the inflamed surface. It must be observed, however, that although some advantage may be derived from the application of leeches a small distance from the eruption, yet as the inflammation is apt to spread, this will not always obviate the evil consequences which are apt to result when they are applied to the inflamed part.

Purgatives are useful in every variety of the disease. When the disease attacks the face, they are particularly serviceable. In the ordinary phlegmonoid form, the saline purgatives are in general the best; but where symptoms of gastric derangement attend, calomel, in small and repeated doses, assisted by an occasional saline aperient, is preferable. In the bilious modification, the exhibition of an emetic will often prove very useful. After the operation of the emetic, large doses of calomel should be given, until the bowels are freely moved. Reil says, that in cases attended with fever of a synochus, inclining to the typhoid grade, emetics are highly serviceable. "If the disease has continued for some days, and the more direct antiphlogistic remedies may no longer be deemed proper, and the inflamed part assumes a pale yellowish hue, and is somewhat œdematous, with but a moderate degree of heat and pain, emetics will generally arrest the progress of the disease effectively."*

The regular action of the cutaneous exhalents should be supported by diaphoretics of the refrigerant kind. The saline mixture, with a small portion of tart. emetic; spiritus mindereri, according to the formula mentioned at page 135; or the sal ammoniac mixture mentioned at page 100, will answer well for this purpose. Small portions of calomel and ipecacuanha in union, are peculiarly beneficial in this disease,† more especially in the erysipelas of infants.—Throughout the whole course of infantile erysipelas, our principal aim should be to restore the regular actions of the liver, alimentary canal, and of the skin; and hence calomel and ipecacuanha, in the proportions just mentioned, with an occasional dose of magnesia or castor oil, and warm bathing, constitutes, so far as my own experience enables me to judge, the most useful course of internal treatment in this variety of the disease.

When the attending fever is typhoid, direct depletion will of course be improper. In cases of this kind, bark and wine have been much recommended; and where the symptoms of prostration are great, it will be necessary to employ them actively.‡ I have used cinchona in conjunction with the carbonate of ammonia,

* Fieberlehre, bd. ii. p. 398.

† ℞.—Calomel grs. ii.
Pulv. ipecac. grs. iii.
Sacch. albi grs. xii.—M. Divide into twelve equal parts. S. One to be taken every four hours by an infant.

‡ [In the low and irritable forms of erysipelas, especially of traumatic origin, I have seen brandy prove infinitely the best remedy. It is generally best, however, to combine Dover's powder or some other opiate with it, and also nutritious gruels or emulsions.—Mc.]

with much advantage, in a few cases of this kind. The quinine, however, would appear to be the best tonic in this modification of the disease. I have had occasion to prescribe it in but one instance of this kind, and its effects in this case were highly gratifying.

But although tonics and stimulants are essential in cases of a low grade of reaction, mild laxatives are almost equally necessary. The bowels are invariably loaded with irritating matters, which, if not removed, tend strongly to oppress and prostrate the powers of the system. In instances of this character, it will be proper to exhibit laxatives conjointly with stimulants, and to continue the use of the latter during, as well as after, the operation of the former. In what is called the *gangrenous* modification of the disease, the fever always assumes a low grade in its progress, however active it may have been in its early stage. Where manifestations of approaching gangrene come on, or where this process has already commenced, wine, opium, camphor, *quinine*,* and the mineral acids, are the remedies upon which our reliance must be placed. Free purging, with active doses of calomel, in the early period of the disease, will, however, very generally render the necessity of tonics and stimulants in the latter stages, much less urgent than when this evacuation has not been sufficiently effected. It should always be recollected, in prescribing for febrile diseases, that intestinal irritation, from whatever cause it may proceed, has a powerful tendency to oppress or prostrate the vital powers; and that, under due precautions, the debilitating effects of purgatives are greatly exceeded by the increased energy imparted by the removal or diminution of such sources of the irritation.

Should the inflammation terminate in suppuration and sloughing, opium and camphor, with quinine or cinchona, are indispensable in all cases. Opium is particularly valuable under circumstances of this kind, by allaying general irritation, and supporting the action of the heart and arteries. Opium may be given advantageously in combination with quinine; and in several instances of extensive suppurative ulceration in this disease, I have known much benefit derived from the extract of conium, in union with camphor, given at short intervals, in full doses. Upon the whole, however, bark or quinine in large doses, and opium, may be regarded as the most useful supporters in such cases.

Where the pain and irritation are great, opium, after proper evacuations, seldom fails to procure much relief. It should be given in full doses, at the same time that cold applications are made to the scalp and forehead.

When secondary inflammation occurs in some internal organ, recourse must be had to local and general bleeding, if the pulse remain sufficiently active; and in all such cases, cupping, sinapisms, blisters, and the other usual revulsives, are indispensable.

In cases attended with prominent cerebral disorder, such as delirium, coma, or insensibility, active purgatives and stimulating enemata are highly important means. For this purpose the *ol. terebinth.* has been found especially efficacious. Mr. Cox has given an account of a case of erysipelas of the scalp, face, and breast, which was attended with delirium, succeeded by coma and insensibility, with other symptoms portending a fatal termination; and which was successfully treated by the daily use of the turpentine combined with castor oil, both by the mouth and per anum. This medicine brought away large offensive stools, and from the first dose the symptoms gradually subsided.†

Some diversity of opinion exists with regard to the propriety or usefulness of local applications to the affected part. Bateman observes, "that with respect to external applications in the early stages of erysipelas, experience seems to

* This article has of late years been much recommended, and deservedly so, in erysipelas of a typhoid tendency. Sir Astley Cooper, in his Lectures, gives the following as, in general, the most successful mode of remedial management. "At first, give calomel for the purpose of restoring the secretions of the liver and intestines, and the liquor ammoniæ acetatis, with antimony, to act upon the secretion of the skin, and then give the *sulphate of quinine*."

† Lond. Med. Repository, April 1825.

have decided that they are generally unnecessary if not prejudicial;" and the same observation is made by Cazenave and Schedel. My own experience has led me to a different conclusion. I have certainly never seen the least injury done by suitable applications of this kind; but, on the contrary, often the most decided benefit. Formerly, physicians were much in the habit of applying cooling or relaxing remedies to the inflamed surface—such as lead-water, cold water, emollient poultices, fomentations, &c. That such applications should prove useless, and often injurious, may be readily admitted. There exists a close analogy between the inflammation of erysipelas and that produced by a scald or slight burn. In both, the capillaries of the inflamed part are debilitated, congested, and passively distended, and in both, therefore, the best applications are such as are capable of exciting or stimulating these vessels to increased tone and activity.—For many years I was in the habit of using a solution of corrosive sublimate, in the proportion of about four grains to the ounce of water, and generally with a satisfactory result.* Pieces of linen or flannel, moistened with this solution, should be laid over the inflamed part, and renewed until the inflammation begins to subside. During the last four years, however, I have invariably used the nitrate of silver in solution, in the proportion of five or six grains to the ounce of water, and almost always with prompt and complete success. This solution is to be applied in the manner just mentioned for the sublimate wash. The mercurial ointment has been a good deal used in this country, as an application to erysipelatous inflammation.† I have myself employed it in several cases; in one, it proved very useful, but in the others, it afforded little or no advantage.—It is to be applied by spreading it on pieces of linen, and laying them on the inflamed part. Dr. Brodie, of London, from some experiments he made with this ointment, came to the conclusion that its good effects depended more on the adipose substance than on the mercurial oxide combined with it, and in subsequent trials, he used only simple ointment, which, in some instances, he says, proved quite as useful as the mercurial unguent. Lard has also been used in this city, and, it is said, with considerable benefit. Brodie objects, and with justice, to the mercurial ointment, on account of its tendency to produce salivation; for in other respects, "its utility seemed unquestionable." Dr. Dewees also speaks favorably of this ointment, but makes the same objections to its use. Some of the English surgeons speak very favorably of an ointment composed of equal parts of ceratum calaminæ, ceratum saponis, and unguentum plumbi acetatis. In St. George's Hospital, it has been used with evident benefit in traumatic erysipelas of the scalp.‡

Blisters applied to the inflamed surface, will often promptly arrest the progress of the inflammation. Dupuytren speaks favorably of this practice, and it has long since been a favorite remedy with many practitioners both in this country and in France. My own experience enables me to say very little of this application. I have resorted to it only in two cases; one of these terminated in extensive suppurative ulceration; the other was benefited by it. Blistering is said to be most useful where there is but a moderate degree of febrile reaction, with a moist and slightly red tongue, and a somewhat hot and tense skin. The blister must be laid directly over the inflamed part, and be large enough to extend a small distance on the sound skin.

* I learned the use of this remedy in erysipelas from Dr. Schott, of this city.

† This remedy was first introduced to the notice of the profession by Dr. Dean, of Harrisburg, although I have learned that, in the interior of this state, it was long before used in this affection by several respectable practitioners. Drs. M'Lellan and Lewis employed it before Dr. Dean became acquainted with its use.

‡ [Of late the tincture of iodine has been a fashionable application to the surface of a part affected with erysipelas. The strong Lugol's solution of iodine is also employed by many. It appears to be quite as efficacious as the solution of nitrate of silver in allaying the irritation, and in checking the progress of the disease. But the red discoloration is quite as disagreeable, and as long of duration as is the blackening of the lunar caustic.—Mc.]

Velpeau and Bretonneau recommend compression by bandages in phlegmonous erysipelas; and their statements do not permit us to doubt that, in some instances at least, much benefit may be derived from this practice. When the disease affects one of the extremities, compression may be easily made; but in the face it is impracticable. It is only in the early stage of the complaint, before vesication occurs, that this practice can be advantageously or safely adopted. In a case which I have attended within the last eight days, I had a satisfactory illustration of the usefulness of this measure. Nevertheless, statements have been published unfavorable to this practice; and Cazenave apprehends, though apparently not from any experience, much mischief from it.

Several late English writers recommend making incisions through the inflamed skin and subjacent adipose and cellular textures. Mr. Lawrence, who strongly recommends this practice, asserts, that "these incisions are followed, very quickly, and sometimes almost instantaneously, by relief, and cessation of the pain and tension;" and a corresponding declension of the inflammation almost always takes place. Mr. Lawrence confines this practice to cases of the phlegmonous kind. Mr. Hutchinson also speaks decidedly in favor of making incisions into the erysipelatous surface. Mr. Lawrence recommends making one free incision, extending from one boundary to the other, through the centre of the inflamed part. Mr. Hutchinson, on the contrary, considers it better to make a number of smaller incisions, about an inch or an inch and a half in length, through the skin and cellular structure. Mr. Dobson, who likewise advocates this practice in a modified form, advises a great number of punctures to be made a short distance from each other, over the whole disk of the affected part.

The experience of Mr. Plymsol, of the Glasgow Royal Infirmary, may also be cited in favor of this practice. "The practice of making incisions in erysipelas phlegmonodes," says Mr. P., "has been established in this infirmary for the last four or five years, and has invariably proved successful; long incisions are generally preferred."

That this practice is calculated to afford much relief in phlegmonoid erysipelas attended with a due degree of constitutional energy, cannot be doubted. The incisions or punctures give exit to the blood congested in the vessels of the inflamed part, and thus contribute directly and strongly to the reduction of the inflammation and its attending affections. In the other varieties of erysipelas—and even in the phlegmonoid form attended with weak powers of vital resistance or a tendency to a typhoid condition, this practice is connected with a considerable risk, from the tendency of the wounds to assume a gangrenous state. Some have indeed expressed much doubt as to the value or general propriety of this practice, even under apparently favorable circumstances; and several respectable writers speak decidedly against its employment.

Mr. James states, that in the cases in which he tried incisions, he did not obtain all the advantage which he was led to expect from Mr. Hutchinson's report of this practice. Several writers strongly protest against this measure, affirming that the wounds are apt to run into mortification.* Mr. James did not find this tendency to mortification *so great* as some appear to apprehend.

* [This is a childish error of opinion. Incisions prevent mortification of the skin in the most depressed constitutions.—Mc.]

CHAPTER XVII.

MINOR EXANTHEMATA.

Sect. I.—*Herpes.*

The term *herpes* was formerly applied in a very vague manner; and the German writers still include under its head various chronic affections of the skin, which by the late English and French writers, are regarded as wholly diverse from each other.* Willan first employed it in a different manner, and restricted its application to a distinct class of cutaneous affections, characterized by an *eruption of vesicles, appearing in groups or clusters on an inflamed surface, "so as to present one or more distinct spots separated from each other by intervals of sound skin."* In most instances, manifest constitutional disorder, such as languor, loss of appetite, restlessness, and occasionally febrile symptoms, with a burning or stinging sensation, or deep-seated aching pain in the affected parts, precede the appearance of the eruption. There is a regular increase, maturation and decline, in the progress of the eruption, but the duration of its course varies from one to three weeks. The fluid in the vesicles is at first limpid, becoming opaque or whey-like and more viscid as the disease advances, and at last either concretes into brown crusts, or the vesicles break, and suffer it to escape, giving rise often to disagreeable and unmanageable ulcerations.

The *diagnosis* of herpes is founded on the assemblage of the vesicles in separate clusters, the red or inflamed state of the skin upon which they are seated, and the natural color of the intermediate spaces of skin. These characteristics distinguish it sufficiently from erysipelas. From tetter, (impetigo,) eczema, and other forms of chronic eruptions, it differs in its purely vesicular form, its more acute character, and particularly in the regular progress of the vesicles from their incipient transparent state to maturation, and finally scabbing.

Herpes admits of being divided into different varieties, according to the particular form of the vesicular clusters, and the part of the body upon which they appear.

1. *Herpes Phlyctenodes.*

This variety of herpes may occur on all parts of the body, having no determined form and seat. The appearance of the eruption is usually preceded, for several days, by slight febrile symptoms, and these sometimes continue after the vesicles have come out. On the part which is about to be the seat of the eruption, we may at first notice a multitude of very minute red points. In the course of twenty or twenty-four hours more, the skin upon which these points appear becomes uniformly red, and small transparent vesicles make their appearance. The cutaneous efflorescence extends a few lines beyond the margin of the vesi-

* Richter arranges *ptyriasis, psoriasis, ecthyma*, and various species of *impetigo*, with the herpetic affections. His fourth species, *herpes pustulosus*, comprehends the five varieties of herpes of Willan. The minute splitting of diseases, so common of late, may be regarded as of very doubtful advantage, both in a scientific and practical point of view. A careful comparison of many of these species—their variable character, and their frequent conversion into each other—shows at once the little foundation there exists for at least some of these subdivisions. The affections arranged under the term *herpes*, by Willan, and others, are, however, sufficiently distinct in their character, and diverse from other analogous disorders, to require separate consideration; and it is of little consequence what name they bear, provided they are properly described and understood.

cular group; and the vesicles themselves are firm and resisting to the touch during the first day. A sense of smarting, and occasionally a dull and severe pain, accompany the appearance of the eruption. (Cazenave.)

The eruption most commonly occurs on the upper parts of the body, particularly on the neck, breast, arms, and cheeks. It consists of small transparent vesicles, aggregated into irregular clusters of various sizes, from a few to nine or ten inches in circumference. These vesicles are sometimes very minute, and at others they are as large as a small cherry. In some instances they come out at first on the neck or breast, "and gradually extend over the trunk to the lower extremities, new clusters successively appearing for nearly the space of a week." This gradual extension of the eruption occurs very rarely, however, except in cases where the vesicles are very minute. In general, the eruption is confined to one or two groups when the vesicles are pretty large. About the fourth or fifth day the vesicles either burst and give exit to the included fluid, or they begin to wither and concrete into yellowish scabs, which usually fall off about the eighth or tenth day, and leave a red and irritable surface. When the eruption appears in successive groups on different parts, the disease will of course be proportionably prolonged; for each cluster passes regularly through its stages of maturation and scabbing. However contiguous the groups of vesicles may be to each other, the intervening skin always retains its healthy appearance. (Bateman.)

Diagnosis.—The only affection with which the present form of herpes is particularly liable to be confounded is *pemphigus;* but an attention to the circumstance that the vesicles in pemphigus are usually large, and always isolated, or, at least, not aggregated in clusters; and that they are very rarely attended with a red or inflamed basis (unless where the bullæ are nearly in contact with each other), will enable us without difficulty to distinguish these affections.

Causes.—Children, and young and robust persons, appear to be most liable to this affection; but of its predisposing and exciting causes we have no definite knowledge. Cold, improper nourishment, or an excess of food, grief, watching, and irritation in the primæ viæ, have been supposed to exercise an agency in its development.

2. *Herpes Zoster.—Shingles, Zona.*

This disease bears a very close resemblance to erysipelas, and was generally regarded as a mere variety of this affection, until Willan pointed out its distinctive characters, and placed it with the herpetic eruptions. This form of herpes is characterized by a band of vesicles, seated on a red or inflamed surface, commencing usually either in the right hypochondrium or lumbar region, and extending like a belt towards the fore part of the abdomen, without, however, crossing the median line. In some instances this band of vesicles passes down to the groin; in others it passes upwards to the inferior angle of the scapulæ, and sometimes extends to the internal part of the arm, "running down occasionally to the cubital border of the hand."

This eruption does not often occur on the left side of the body; indeed I have seen but very few instances of its location on this side. Velpeau* and Brendel, however, assert the contrary. The former saw but one instance of its occurrence on the right side, out of thirty cases. The majority of writers, nevertheless, affirm that it generally makes its appearance on the right side, and my own experience is strongly in favor of this observation. It has never been found to occur on both sides at the same time. These vesicular zones are composed of irregular groups, from one to three inches in diameter; and where the clusters are not very close to each other, the intermediate skin retains its healthy color. The extension of the band does not occur by a regular succession of

* Revue Médicale, December 1828.

vesicles, but by successive new clusters coming out nearly in a line with the first. This, like the preceding variety of herpes, is generally preceded for a few days with loss of appetite, lassitude, slight headache, nausea, more or less febrile irritation, "together with a scalding heat and tingling in the skin, and shooting pains through the chest and epigastrium." In some instances, however, little or no constitutional symptoms can be perceived.* At first vividly red blotches appear arranged into an irregular belt, a short distance from each other. Upon these inflamed surfaces, a number of small whitish points appear, which soon increase in size, and become distinct transparent vesicles "of the size and appearance of small pearls." These vesicles increase in magnitude until the third or fourth day, when they acquire a yellowish or milky appearance, and on the following day begin to shrivel, at the same time that their bases acquire a darker red, or bluish color. The vesicles about this time break and discharge a viscid serous fluid which dries into brownish crusts, which fall off about the tenth or twelfth day. Sometimes excoriations and occasionally superficial ulcerations occur, leaving strongly marked cicatrices.

The disease does not, however, always pursue this regular course. In some instances the vesicles dry up about the fifth or sixth day—the fluid in them being absorbed—and terminate without scabbing, by desquamation. In old and enfeebled subjects, the eruption has been known to terminate in gangrenous ulceration of the skin.

Causes.—Zona is most apt to attack young persons;† and it is said to occur more frequently in males than females. (Bateman, Cazenave.) Reil asserts that this affection has never been observed in children under three years old. It seems occasionally to arise from the influence of cold; and some have ascribed its occurrence to irritation of the urinary organs. (Reil.) Disorder or irritation of the primæ viæ, and perhaps of the biliary organs, has appeared to me, in some instances, to be at the root of the disease. It is said to have prevailed epidemically. (Cazenave.)

Prognosis.—This form of herpes is but rarely attended with severe symptoms. When it terminates in ulceration, it may become troublesome; and the occurrence of gangrene, which, however, is very uncommon, will of course be attended with more or less danger, according to its extent and the patient's constitutional vigor.‡

Treatment.—The treatment of *herpes phlyctenodes* and *zona* is to be conducted on the same principles. Gentle aperients, a simple and unirritating diet, and rest, will, in general, suffice for the constitutional treatment. When there is considerable restlessness, and some degree of febrile irritation, we may prescribe mild diaphoretics and cooling acidulated diluents. Where there is reason to suspect gastric or biliary irritation, minute portions of calomel and ipecacuanha will be proper. The warm bath will also be useful to allay restlessness

* Cazenave and Schedel observe, "We have seen a great number of instances of zona in the Hospital St. Louis, and have never seen it accompanied with those general symptoms, and particularly of a gastric nature, with which it has been asserted it is always attended; a state of uneasiness, in some rare cases a slight excitement of pulse, heat of the skin, a sensation of tension, which is generally painful about the seat of the eruption, acute pain in those parts where the disease terminates in ulceration, and finally a slight local pain, remaining some time after the eruption has disappeared, (not acute, as has been said,) are the only phenomena which, in a majority of cases at least, accompany this variety of herpes."—*Practical Synopsis*, p. 104.

† We often meet with perplexing discrepancies in the statements of different writers, on points, too, which are matters of mere observation. Thus in the present instance, Reil's observations are directly opposed to those of Willan, Bateman, Cazenave and others. "Of the *causes* of zona, we know at least that those who are most subject to it are old and cachectic persons, with a relaxed skin and visceral disorders."—*Fieberlehre*, bd. v. p. 399. My own observations, however, lead me to the opinion expressed in the text upon this point.

‡ In relation to the prognosis of this affection, we find very different sentiments expressed by the old writers. Pliny, Lannge, Dr. Hoffman, and Shulze considered it a dangerous disease; whereas Burserius, Vogel, Lorry and Diel assert the contrary opinion.—*Reil*, loc. cit., vol. v. p. 400.

and dispose to a regular action of the skin. Occasionally the arterial excitement is such as to warrant small abstractions of blood by venesection or leeching. Reil recommends particular attention to the renal functions, and advises diuretics where the urinary secretion is scanty. Where there is much deep-seated pain, we may use full doses of Dover's powder with benefit.

Bateman considers external applications unnecessary during its vesicular state; and Cazenave asserts that "they are useless." My own experience has led me to a different conclusion. It is indeed true, that "saturnine and other similar astringent lotions" are of little or no service. I have, however, uniformly found the application of a solution of lunar caustic, in the proportion of six or eight grains to an ounce of water, when employed soon after the vesicles appear, to arrest the progress of the eruption, and cause desquamation in the course of three or four days at furthest; and sometimes much earlier. I have never known the slightest inconvenience to result from this practice. I keep this solution constantly applied to the affected part, by strips of linen or flannel saturated with it.* M. Velpeau, also, has expressed the most favorable opinion of the powers of this application in zona. He affirms that when applied before ulceration has taken place, it never fails to arrest the progress of the malady, and, so far as he has observed, always without unfavorable consequences.†

3. *Herpes Circinnatus.—Ringworm.*

This form of herpes is easily recognized by the annular arrangement of its small vesicles. It commences with slight redness and itching, succeeded by a circle of minute globular vesicles closely set together, which, when closely examined, are found to contain a colorless fluid. These coronæ of vesicles vary from an eighth of an inch to two inches and upwards in diameter, and the larger ones leave the central portion of the skin apparently in a natural state. The vesicles break in four or five days after their appearance, and are succeeded by little prominent, brownish, and thin crusts or scales, which, in the majority of cases, fall off about the eighth or ninth day, leaving a red surface which gradually disappears. Occasionally the whole disk of the circle is somewhat inflamed, "and a slight desquamation occurs without the formation of vesicles." When the circles are very small, the eruption withers, and gradually exfoliates without the formation of crusts or scales. Although the eruption is seldom protracted beyond the tenth day, yet in many instances new circles of vesicles appear, in succession, so as to prolong the whole course of the disease for several weeks. The eruption is always attended with a troublesome itching and tingling sensation.

This variety of herpes is most frequently met with in children, and occurs generally on the arms, shoulders, breast, and especially on the neck and face.

This disease must not be confounded with a somewhat similar affection which occurs only on the scalp, (porrigo scutulata,) and which is familiarly known by the term *hair-worm*. This disease is contagious, destroys the hair, and is pustular. Its duration is indefinite and long, and it gives rise to the formation of thick adherent scabs.

There is a variety of ringworm, not noticed in the work of Cazenave, though described by Bateman, which is by no means uncommon in this country, and which often continues for many months, and at last takes up a large extent of surface. It commences with a small circle of vesicles, like the form just described. This circle, however, gradually enlarges its circumference, by the successive appearance of new vesicles around the external margin of the ring, whilst those situated on its internal margin heal and desquamate.

* The lunar caustic was, I believe, first used as a local application in this affection, by M. Geoffroy.—*Revue Médicale*, April 1820.

† Loc. citat., p. 435.

Treatment.—The treatment is almost exclusively local. Alkaline washes, such as a lotion of from one to two drachms of subcarbonate of potash or soda to a pint of water; or solutions of nitrate of silver, sulphate of zinc, or of copper. One of the best applications I have met with in this affection, is an ointment made of the root of the common narrow-leafed dock, (*rumex crispus,*) by boiling the grated root in lard. Mild laxatives should be used if the eruption is extensive.

4. *Herpes Labialis.*

This is a vesicular eruption which occurs on the upper and under lips, and particularly at the outer angle of the lips, extending sometimes nearly round the mouth, and occasionally to the cheeks, alæ nasi, and chin. In some instances this eruption appears almost suddenly, without any previous redness or disagreeable sensation in the part; and at others it is preceded by a slight tenderness or pain, inflammation and swelling of the skin, for three or four hours. The lip generally becomes somewhat swollen, hard, stiff, and tender. The vesicles sometimes "attain the size of a small pea, and are filled with a transparent fluid," which soon becomes opaque, acquiring a straw color, or sero-purulent appearance, during the third or fourth day. In the course of a day more they shrivel, and are succeeded by light-brown scabs, which usually separate on the seventh or eighth day. This eruption is always attended with very considerable heat and smarting, and soreness to the touch.

This variety of herpes does not often occur as an idiopathic affection. It generally appears on the subsidence of slight febrile affections from cold, as well as on the declension of other acute diseases, more especially such as are connected with visceral affections. It may in fact be considered, in cases of this kind, as a phenomenon of crisis, for it is a common, and in general not an incorrect observation, that the occurrence of this eruption indicates the near approach of convalescence. In many instances it is accompanied by coryza, and pain or tenderness in the fauces. It may be produced by irritating applications to the lips.

The only remedial applications necessary in this affection, are such as palliate the burning heat and pain, when these are troublesome. For this purpose, fomentations, with a decoction of white poppy heads, or cold water, with a small portion of acetate of lead dissolved in it, may be used.

5. *Herpes Preputialis.*

This variety of herpetic disease occurs on the prepuce, and may readily be mistaken for chancre, to which indeed it sometimes bears a very close resemblance. It begins with one or more red spots, attended by itching, and a sense of slight heat in the part. Small vesicular elevations soon appear on these inflamed surfaces. When the eruption occurs on the external surface of the prepuce, the vesicles dry up about the sixth day, and are converted into small, firm scabs, which usually fall off by the end of the ninth or tenth day, and leave the skin underneath sound.

When the eruptions occur on the internal surface of the prepuce, they generally break out about the third or fourth day, and form small scales, which soon separate, and leave excoriations, passing sometimes into superficial ulcerations, with white bases, and slightly elevated edges. If left to themselves, or not irritated, these sores continue nine or ten days before they begin to heal, but when they once commence this process, they usually cicatrize rapidly.

This affection may arise from the prepuce being chafed by woolen clothing; from the irritation of morbid vaginal discharges; and particularly from suffering the natural secretions of the part to remain between the glands and prepuce.

Treatment.—I have generally employed a solution of borax with much advantage in this affection. When the excoriations are slow in healing, a very

weak solution of the nitrate of silver is perhaps the best application. I have used this solution in a number of cases with prompt benefit. The chloride of soda in solution is likewise a very efficacious application in cases of this kind. I have lately employed this lotion in two obstinate cases with marked success. It was first recommended by Lisfranc. I used this article in the proportion of twenty grains to an ounce of water, and applied it five or six times daily.

Sect. II.—*Pemphigus.**

The term *pemphigus* is used to designate a peculiar exanthematous affection, characterized by fever, followed in the course of from one to three days with large transparent vesicles, having red and inflamed bases. The occurrence of such a disease, as an independent or idiopathic affection, has been much doubted by many writers, and some have even denied its existence altogether. Willan, Bateman, Plumbe, Reil, and a number of other writers, contend that the cases which are described by the early writers as acute idiopathic pemphigus, were—typhus, pestilential, or other *milder* forms of fever, attended by bullæ, as mere casual symptomatic and unessential eruptions. Gilbert,† and Biett,‡ on the other hand, admit the occasional appearance of acute pemphigus as an idiopathic malady. There can exist but little doubt that many of the cases described by authors as *pemphigus*, were in relation to their vesicular character, purely symptomatic; for bullæ entirely similar to those which are ascribed to this affection, have been known to occur in diseases obviously diverse in their general essential characters. They have occurred in intermitting fever;§ in bilious remittents;‖ in dysentery;¶ in typhus;** in various modifications of malignant as well as in *arthritic* fevers;†† in hysteric affections;‡‡ and in the ordinary catarrhal fevers, as well as in various other forms of febrile disease. Cazenave states that he saw a case in the Hospital of St. Louis, in which "this eruption was attended not only with gastro-intestinal irritation, but also with a pulmonary catarrh, and ophthalmia, and a very acute inflammation of the urethra. All these symptoms, together with the eruption, disappeared in the course of a month." It is difficult to conceive upon what grounds he regards this as a case of idiopathic pemphigus; for in its general course and phenomena it is greatly at variance with his previous description of this affection. Most assuredly, if this case deserves to be regarded as an instance of pemphigus, we may with little hesitation admit the many supposed examples of this disease, which have been reported by different writers (but rejected by Cullen, Willan, Bateman, and Reil) as genuine, though modified instances of this affection. Under this perplexing contrariety of statements and opinions, it is no easy matter to come to any satisfactory conclusion on this head. That the appearance of bullæ, or large distinct vesicles, in febrile affections, is often casual or symptomatic, and sometimes apparently critical, is unquestionable;§§ but it is nevertheless difficult to deny, merely from this gene-

* The first distinct account that was given of this disease, is to be found in the writings of Piso (observ. 149) and Morton (tract. de morb. acut.) It has since been described under a great variety of names—such as *febris catarrhalis vesicularis*, (Delius. amœnitat. Med., dec. 1;) *febris vesicularis*, (Macbride and Selle, prax. medic., t. 11, c. 18;) *febris pemphygodes*, (Seeliger, Ephemer. N. C., dec. 1, ann. viii. ob. 56;) *febris phlyctenodes*, (Burserius;) *hydatides*, (de morbis a colluvie serosa orta;) *febris bullosa*, (Brugmann.)

† Monographie sur le Pemphigus.

‡ Cazenave and Schedel. Pract. Synop. of Cutan. Diseases.

§ Braune. Versuch über den Pemphigus, &c. Leipzig, 1795.

‖ Salabert. Abhandl. für prac. ärzte, vol. xiii.

¶ Bontius. De Medic. Ægyptiorum. Rengger. Museum der Heilkunde. Zurich, 1794.

** Médécine Experimentale. †† Hufeland's Journal, vol. xi. p. 138.

‡‡ Frank. Epitome, tom. iii. p. 269.

§§ Frank saw an instance of inflammatory fever, in which, after the fifteenth venesection, a critical pemphigus broke out.—*De Curandis, Hom. Morb.*, L. 111, p. 265.

ral fact, that they may appear in an acute form as an idiopathic or independent malady. Whether, however, this eruption be always, or only generally symptomatic, I shall now describe it, as it has been observed and recognized for genuine acute pemphigus by several recent writers, who must have been fully acquainted with the doubts expressed on this subject by Cullen, Willan, and others, and who, we may therefore presume, were better prepared to estimate the character of the disease than the early writers.

Pemphigus appears under two distinct forms; the *acute* and the *chronic*. The latter form is described by Willan, Bateman, and other late writers, under the name of *pompholix*.

Symptoms of acute pemphigus.—The disease commences with symptoms of general indisposition, or more or less febrile irritation. In some cases, the precursory symptoms amount only to a feeling of general languor and uneasiness, with slight acceleration of the pulse, and itching of the skin. In others, nausea, loss of appetite, slight chills, increased thirst, and great frequency of the pulse, with a hot and burning skin, precede the eruption. At an indefinite period from the commencement of these symptoms—varying from one to four days—the eruption makes its appearance. At first, small red circular spots come out, which speedily increase in size, each one becoming covered with a transparent vesicle. These vesicles or bullæ are of a circular form, and vary from the size of a pea to that of a large hazelnut. Sometimes the bullæ are much smaller than the red spots upon which they are seated, leaving a considerable inflamed margin around their base; at others, they cover nearly the whole surface of the circular spots, with only a very narrow line of red border. Cazenave and Schedel seem to regard these red areolæ or bases as invariably present and strongly characteristic of acute pemphigus. Richter, however, observes, that the bullæ sometimes appear to rise out of a sound skin, without the least redness around their bases. Some spots occasionally appear on the skin which do not vesicate; but to the touch they will be found slightly elevated, "and when they are rubbed for a short time, the cuticle becomes detached, and a slight exudation of serous fluid takes place under it."

The bullæ increase in size during the first twenty-four hours, and the contained fluid, at first limpid, becomes yellowish, and finally turbid.* They sometimes break on the second day; but much more commonly they remain in a turgid state to the end of the third or beginning of the fourth day, when the fluid begins to be absorbed, and the vesicles shrivel, leaving either thin brownish crusts or only "small dry, white epidermic lamellæ. which in a few days longer separate, exposing pale red surfaces.† If the bullæ are broken at an early period, they sometimes rise again, but more frequently superficial suppurative ulcerations ensue." (Richter.)

The occurrence of the eruption has no manifest influence on the general symptoms, the fever continuing usually without any obvious change until the bullæ begin to wither. (Richter.) The eruption may come out on any part of the body, and either occupy only a particular region, or appear scattered over the greater part, or the whole surface of the body. In most instances, however, the bullæ are confined, at first, to a single part; when these begin to disappear, another crop comes out on some other portion of the body; and in this way, two or three successive eruptions may take place, so as to protract the whole course

* This fluid has been noticed acrid or irritating, like the tears in violent catarrh. Occasionally it is reddish, as if a small portion of blood were mixed with it. Very generally, however, it is perfectly bland and unirritating, at least in the early period of the eruption.—*Richter, Specielle Thérapie*, bd. ii. p. 604.

† The spots left by this eruption are said to be peculiar. "We have several times seen M. Biett draw a diagnosis from them as to the previous existence of bullar eruption, which had been cured some time before. They are of a dull red color, separated from each other, of an irregular form, of variable size, and form slight exfoliations from time to time."—*Cazenave and Schedel*, loc. cit., p. 129.

of the disease, sometimes to a period of between two and three weeks. The internal mucous surfaces, also, are liable to become affected, particularly the mouth, fauces, and œsophagus, and probably the mucous membrane of the alimentary canal.

The *pompholix solitarius* of Willan is, according to Cazenave and Schedel, a mere variety of acute pemphigus. This is an extremely uncommon form of the disease, and may assume a more or less chronic character, although its usual duration is from eight to ten days.* Willan says that it seems to be entirely confined to females. A sensation of tingling of some portion of the skin is at first felt; this is succeeded by one large vesication, (appearing usually at night,) which is rapidly filled with a transparent colorless lymph. This large bulla breaks in the course of forty-eight hours, and leaves a superficial ulceration. In a day or two a second vesication occurs near the first one, which runs through the same course; and a third or even a fourth one may rise in succession, so as to protract the disease to the ninth or tenth day. (Bateman.)

Chronic pemphigus.—Willan and others who deny the existence of acute idiopathic pemphigus, describe the present variety of the disease as a distinct affection, under the term *pompholix*. They assert that the bullæ appear "without any inflammation around them, and without fever." This, says Richter, is not entirely incorrect. In many cases the disease commences with distinct febrile symptoms, which continue occasionally until the first eruption is completed: and, in some instances, the slight fever reappears afterwards, whenever a new and numerous eruption of bullæ is about to take place.† In almost all cases, the patient experiences a slight degree of lassitude, pain in the limbs, and languor, for several days previous to the appearance of the eruption. Nor does the observation that the bullæ are always "without any inflammation around them," appear to be correct, for in some instances "the secondary eruptions have erythematous areolæ." (Cazenave.) The bullæ begin by small red elevated points, on the centre of which the epidermis becomes speedily raised. These rapidly enlarge "into irregular vesications, acquiring often in a few hours the size of a hazelnut or even a walnut." If they do not break, they begin to shrivel about the third or fourth day, the fluid contained acquiring a reddish and opaque appearance. In a few more, the withered and macerated cuticle dries into thin brownish crusts. If the bullæ break at an early period, "the cuticle shrivels, or becoming partly detached, rolls up and lays bare a portion of the inflamed surface," or separates entirely, and exposes a painful superficial ulceration. (Cazenave.)

This affection is generally very tedious in its course, and may continue for several years. A continual succession of bullæ occurs on different parts of the body, sometimes in successive crops, and at others in such a manner, that, at the same time, some will be just appearing, others will be large, and distended with a straw-colored lymph, and others again shriveling, or already converted into small crusts. Occasionally the bullæ are so numerous that many of them run into each other, and in this case some of them usually become purulent, and on drying up leave thin yellowish crusts extending over a considerable portion of the body.

When the eruption is moderate, the patient does not in general experience much inconvenience from the disease; but in cases attended with numerous vesications, and particularly where the lymph is somewhat irritating, a burning and extremely distressing itching is experienced, which in violent cases sometimes obliges the patient to keep to his bed.

In some instances the vesicles are early attended with severe burning pain,

* Cazenave, Synopsis, &c., p. 124.

† Specielle Thérapie, bd. ii. p. 613. Reil says that in some cases the febrile symptoms are conspicuous in the commencement, but that these gradually subside, leaving only a chronic *bullar* eruption, which continues often for many months and even years.—Loc. cit., p. 428.

become filled with a *red* acrid humor, and terminate in superficial suppurative ulcers, which heal very slowly. Reil observes, that bullæ, containing bloody lymph, occur only about the ears, where previous vesicles have already occurred.* Wichmann relates a case in which, nine months after the commencement of the disease, he found the patient extremely tormented and debilitated by a great number of large ill-conditioned ulcerations on the lower extremities and sacral region. The ulcers appeared red, and the surrounding skin as if it had been scalded with hot water.† A somewhat similar case is mentioned by Cazenave and Schedel.

This affection may occur simultaneously on every part of the body; but in most instances the vesications are confined to a particular space. In the palms of the hands and soles of the feet they occur but very rarely. They have been observed on the internal surface of the mouth, the fauces, œsophagus, and the alimentary canal; in these situations they soon assume the appearance of aphthæ. The tongue and fauces occasionally become excoriated in cases of this kind. Colic; constipation; bloody and mucous alvine discharges; nausea; vomiting, or hæmatemesis, have been known to supervene in cases where the disease affected the alimentary canal. (Wichmann, Reil.) "At times, it would seem as if the eruption on the external and internal surfaces alternated—the symptoms of the latter increasing as those of the former decrease, and *vice versa*."‡ Both Wichmann and Braune relate cases in which the mucous membrane of the bronchiæ became affected during the progress of this malady. Several instances are mentioned in which cough and purulent expectoration came on.

Cause.—Of the etiology of pemphigus there is as yet but little known of a satisfactory or definite character. It is said to be more common in old than in very young individuals, and in women than men.§ Braune supposes that this affection is frequently dependent on deficient or disordered urinary secretion; (loc. cit., p. 59.) Habitual deficiency of this secretion, and obstinate chronic cutaneous disorders, are indeed not unfrequently associated affections. In one of the instances of chronic pemphigus mentioned by Braune, the intimate connection between the action of the kidneys and the cutaneous affection was manifested in the clearest manner. Whenever the urine flowed freely, the bullæ disappeared; but they invariably reappeared when this secretion became scanty, watery, and muddy. Renal calculi were discharged from time to time with the urine. Richter, Wichmann and Reil also admit the frequent occurrence of renal disorder in pemphigus. It would seem, also, that disorder of the liver is a frequent attendant on this disease—whether as cause or effect, is not known. Biett, in his dissections in the Hospital St. Louis, several times met with structural disease of the liver, in persons who had died under this disease. (Cazenave.)

The irritation of dentition; neglect of personal cleanliness; a deficient and coarse diet; habitual exposure to a damp atmosphere; and chronic visceral affections, would seem sometimes to favor the development of the disease. It arises, however, often without any perceptible cause, either predisposing or exciting. It is said to have occurred endemically. The same individual may be affected with it several times, at distant intervals. This disease is not contagious. Hall inoculated with lymph taken from the bullæ without effect.‖

Diagnosis.—Acute pemphigus is liable to be confounded with *rupia simplex*, *ecthyma* and *herpes phlyctenodes*. From the first of these affections it differs, by the bullæ in *rupia* being few in number, and followed by ulcerations upon which thick and projecting scabs are formed. It is distinguished from the second by the bullæ in *ecthyma* being less elevated, and filled with a purulent fluid, hav-

* Fieberlehre, bd. v. p. 418.

† Beitrag zur Kenntniss des Pemphigus.

‡ Braune. Versuch über den Pemphigus und das Blasenfieber. Reil, loc. cit., p. 420.

§ This at least is in conformity with the observations of Reil and others. Cazenave, on the contrary, says that the chronic form of the disease "rarely occurs in women."

‖ Duncan's Annals of Medicine, for the year 1799.

ing a brownish spot in the centre of each. From the last disease it may be distinguished by the vesicles in *herpes* always appearing in clusters seated on a *diffused* red and inflamed surface. Although several bullæ in pemphigus are occasionally found collected in one or more groups, yet distinct bullæ appear elsewhere on the body, which is not the case in herpes.

Prognosis.—The acute form never terminates fatally unless dangerous secondary affections supervene. In relation to the probable duration, ultimate violence and obstinacy of the chronic form of the disease, the prognosis is in general very uncertain. Some cases continue moderately for eight or ten weeks, and then disappear; others apparently equally mild during the first four or five weeks, gradually acquire more and more severity, and continue for many months in an aggravated and very distressing form, and may even terminate fatally. The degree of danger depends, of course, in a great measure, on the extent of the eruption, the obstinacy of its progress, the nature of the visceral affections with which it may be complicated, and the degree of constitutional vigor of the patient. When the vesications assume a livid or bluish appearance, there is much reason to apprehend unfavorable consequences. (Reil.) Old, worn down, relaxed, arthritic and nephritic subjects, are most apt to suffer severely from this affection.

Treatment.—In the *acute form of the disease*, it will in general be sufficient to put the patient on a simple and unirritating diet; to prescribe an occasional mild laxative; cool acidulated diluents; rest; and to avoid a humid and variable atmosphere. If inflammatory symptoms supervene, or the eruption is very extensive, a more active antiphlogistic treatment is required. Gentle purgatives; the ordinary saline diaphoretics, particulary the alkaline effervescing draught (portio Riverii); tepid bathing, and venesection, must be used with an energy corresponding to the degree of the general and local inflammatory excitement present. Richter recommends calomel in such cases above all other aperients. He also advises the use of diuretics, if the disease manifests a disposition to continue beyond its ordinary course—and of these, he says, digitalis is the best, squills being, according to his experience, objectionable. All local applications must be avoided, nor should the vesicles be disturbed or opened. Cazenave recommends the application of leeches to the anus.

In *chronic pemphigus*, (*pompholix*,) we should, in the first place, endeavor to ascertain whether any visceral or other general disorders co-exist, or preceded the eruption. Should there be grounds for presuming the presence of a syphilitic taint, or of an arthritic or calculous diathesis, or finally of hepatic or some other visceral affection, recourse should be had to remedies suited to counteract the lurking affection. (Richter.) In general, a *moderately* antiphlogistic treatment —such as acidulated diluents, mild aperients, and tepid baths, will be proper in the commencement. The German writers speak very favorably of the employment of diuretics in this variety of the disease. They are particularly indicated where the urinary secretion is scanty or unnatural. Richter says that he cured an inveterate case in a short time by the following mixture,* in conjunction with the free use of an infusion of juniper berries. The same writer recommends *dulcamara*, in union with *antimony*.† Limewater in large portions; infusions of herba jacea; sarsaparilla; precipitated milk of sulphur; belladonna; and opium, have all been mentioned as remedies in this affection. I have met with but one

* ℞.—Extract. digital. purpur. grs. iii—iv.—vi.
Submuriat. hydrarg. mitis gr. i.
Opii puriss. gr. ss.
Sacch. albi grs. xv.—M. Divide into twelve equal parts. S. Take one three times daily. The proportion of digitalis should be gradually increased. If the gums become affected, the use of the medicine must be suspended for a while.—Loc. cit., p. 615.

† ℞.—Antimon. crud. nigri.
Pulv. stipit. dulcamara, ää ʒi.
Extract. trifol. aquat. ʒii.—M. Divide into two grain pills. S. Take ten three times daily.

case of chronic pemphigus. It continued for six months, under various modes of treatment, and at last disappeared under the use of Fowler's arsenical solution. When diarrhœa, with more or less obtuse abdominal pain, supervenes, opium is particularly serviceable. When pulmonary irritation occurs, attended with frequent and violent cough, spitting of blood, and oppressed respiration, local and general bleeding become necessary, after which opium and calomel may be administered with benefit. When, by long continuance and severity of the disease the strength of the patient is exhausted, or when the disease occurs violently in old, relaxed and worn down subjects, quinine, with the sulphuric acid; a nourishing diet; occasional opiates; chalybeate preparations; and other supporting remedies should be employed. Cazenave and Schedel state that they have observed several examples in the Hospital St. Louis, of the very good effects of tonic remedies even in young subjects, where the eruption was of long continuance.

Sect. III.—*Urticaria—Nettle-rash.*

The nettle-rash, a very common cutaneous affection, is characterized by hard elevations of the cuticle, of irregular forms, with a pale or whitish centre, and generally a diffuse redness around their margins, attended with intolerable itching, and a stinging or smarting pain.

Its course is often very rapid, the eruption appearing suddenly, and vanishing again in the course of a few hours; although in such cases it usually reappears for several days in succession. It may also assume a chronic character, and continue, with occasional transient intermissions or remissions, for many months, or even years.

Urticaria febrilis.—Symptoms of general indisposition, such as nausea, languor, drowsiness, slight chills, headache, anorexia, pain and anxiety in the epigastrium, with an accelerated pulse, precede the appearance of the eruption. At first, a general itching with a feeling of tingling heat is felt over the whole body; to relieve which, the patient is apt to rub or scratch the skin, which never fails to bring out, almost instantaneously, large patches of red elevations or *wheals*, with whitish central disks and irregular crimson areolæ, attended with an extreme degree of itching and tingling. The eruption speedily becomes more or less extensively diffused over the surface, particularly on the palmar aspect of the forearms, around the knees, along the loins, on the inner part of the thighs, and on the shoulders. The eruption vanishes irregularly on different parts of the body, but is almost immediately recalled "on any part of the skin, by strong friction or scratching." During the day the eruption subsides, but as the evening approaches, it returns, together with slight febrile irritation; and in this manner the disease is usually protracted to the sixth or seventh day before it finally subsides. The parts principally affected become swollen and uniformly red; but the swelling always soon subsides after the eruption disappears. More or less languor and febrile irritation accompany the disease throughout; "the disorder of the stomach, however, is relieved by the appearance of the eruption, but returns whenever the eruption reappears." (Bateman.)

Urticaria evanida.—This variety of the disease is unattended by fever, and often continues for many months under a succession of transient wheals, appearing here and there on the body, and vanishing again in a few hours, at short and irregular intervals. An eruption will perhaps appear on one arm in the morning, and disappear again in a few hours; in the afternoon, the wheals may come out on the legs and remain for a short time; and after a short interval, or only on the following morning, they may appear on the body. In this way the disease may go on to a very protracted period—the eruption appearing and disappearing frequently, "according to the temperature of the air or the exposure of the patient, and the degrees and kind of exercise which he uses." The slightest friction or

scratching will almost immediately bring out the wheals on any part of the body; but when thus excited, they usually recede again in a very short time. The eruption consists of irregular patches slightly raised and firm to the touch, or of elongated wheals, "like those produced by the stroke of the whip, or they are round, resembling the firm, elevated tumors produced by the bite of a mosquito." These wheals are not surrounded by an erythematous areola, although sometimes encircled by a very narrow and faint streak of red. They are always attended with violent itching, and a sensation of tingling or stinging pain, more particularly "on undressing and getting into bed." Languor, headache, transient pains, and derangement of the digestive functions, are apt to occur during the course of the disease; but in some instances scarcely any symptoms of constitutional or sympathetic disorder, except the cutaneous affection, attend. "Its course varies from a few days to many months, and even years." (Bateman.)

Urticaria tuberosa.—This rare variety of the disease is characterized by hard, prominent wheals, or tuberosities, attended with deep-seated pain, tension, and difficulty of motion. The eruption occurs chiefly on the loins and on the extremities. It generally comes out at night, and disappears before morning, leaving the patient "weak, languid, and sore, as if he had been bruised or much fatigued." Cazenave and Schedel state that they saw at the Hospital St. Louis, an instance accompanying a quotidian fever which, after having lasted for four years, finally terminated "in swellings, great distension, ecchymosis, ruptures, and ulcerations." Some paroxysms were attended with so much general tumefaction, as to produce oppressed and hurried respiration, a livid and puffed face, weak and intermitting pulsation of the heart, and other very alarming symptoms.

Urticaria subcutanea.—In this variety the wheals seem, as it were, to lurk beneath the skin, and make their appearance only at distant intervals. An almost constant tingling sensation, however, is felt in the skin, with occasional severe pricking sensations, as if needles were thrust into the surface, limited at first to a single part, but extending afterwards to others. Individuals affected with this variety of the disease, are apt to suffer frequent pain in the stomach, and cramps in the muscles of the legs. (Bateman.)

Causes.—Urticaria is most commonly met with in children, young females, and in persons of a sanguine and nervous temperament. The seasons most favorable to its occurrence are spring and summer. Some individuals are so strongly predisposed to the disease, that the least friction or scratching almost immediately brings out large wheals. The irritation of dentition, mental excitement, and various articles of food, such as strawberries, raspberries, mushrooms, honey, oatmeal, green cucumbers, almonds, dried or smoked fish, lobsters, shrimps, crabs, and particularly *muscles*, are apt to produce febrile urticaria in some individuals. The internal use of valerian and *balsam copaiba* produce extensive urticaria in some persons. Chronic urticaria is frequently connected with an irritable and deranged state of the digestive functions. The *tuberous variety* "seems to be excited by excess in diet, overheating by exercise, and the too free use of spirits." Urticaria is also produced by direct irritating applications to the skin, particularly by the leaves of the common nettle (*urtica dioica*) and by the contact of certain caterpillars, as the *phalæna processionacea*. It occurs sometimes in the course of various febrile diseases, and is often speedily produced by taking a draught of cold water after the body has been excited or heated by exercise. In many instances, however, the disease makes its appearance without any *manifest* exciting cause; occasional dependence on peculiar idiosyncrasy or constitutional habit is unquestionable. In children it often occurs during the process of dentition, or apparently from acidity in the primæ viæ, and is in them usually called *hives*.

Prognosis.—Although often an extremely tormenting affection, from the intolerable itching and stinging pain which attend, urticaria is almost universally wholly devoid of dangerous consequences. Werlhof, indeed, observes, that it has in few instances terminated fatally; but death probably occurs only where

the eruption is secondary, and associated with some other more serious malady. Richter says that in children the disease is sometimes accompanied with great difficulty of breathing. The sudden recession of the eruption does not appear to give rise to any unfavorable consequences.

Treatment.—In the febrile variety of the disease, advantage may sometimes be obtained from an emetic of ipecacuanha. Richter states that the operation of an emetic will occasionally put a speedy stop to the progress of the disease. In general, however, one or two mild laxatives, rest, simple diet, cooling drinks, and the occasional use of the tepid bath will be sufficient. When there are symptoms of acidity in the primæ viæ, magnesia or alkaline remedies, particularly lime-water, will be proper. When the disease occurs in irritable and debilitated subjects, or in persons of weak and disordered digestive powers, benefit may be derived from moderate doses of quinine, sulphuric acid, and the usual preparations of iron, after the alimentary canal has been evacuated by emetic and laxative remedies. Reil says, copious draughts of cold water often produce a very good effect.

In the chronic variety of urticaria, particular attention should be paid to the diet; for, in some instances, it would seem to depend on some article of food rendered oppressive or irritating to the stomach by constitutional habit or idiosyncrasy. "I have," says Willan, "desired several persons affected with chronic urticaria, to omit first one, and then another article of food or drink, and have thus been frequently able to trace the cause of the symptoms. This appeared to be different in different persons. In some, it was malt liquor; in others, spirit or spirit and water; in some, white wine; in others, vinegar; in some, fruit; in others, sugar; in some, fish; in others, unprepared vegetables." Almost all the useful diaphoretic alterative remedies, such as sarsaparilla, the root of burdock, the golden sulphuret of antimony, dulcamara, Lisbon diet drink, &c., have been at times recommended, but they rarely appear to afford any particular advantage. Fowler's solution, however, is a very efficacious remedy in the chronic form of the disease. It is mentioned by Cazenave as having been successfully used in a very obstinate and distressing case of this kind. Dr. Dewees has used it frequently with success, and I have myself employed it in a few obstinate cases with the happiest effect.

To relieve the extreme itching, various external applications have been recommended. Vinegar and water, or lemon juice diluted with water, will sometimes procure considerable relief. The tepid bath, also, may be used as a palliative for this purpose. Sea-bathing, or washing with salt water, has been used with good effect, both as a palliative and a curative means. Dusting the affected part with rye meal or hair powder, gives some relief from the itching and tingling.

Sect. IV.—*Miliaria—Miliary Fever.*

This is a febrile affection, characterized by an eruption of acuminated vesicles, of the shape and size of millet seed, more or less thickly scattered over the surface of the body. These minute vesicles are at first red, and surrounded with erythematous areolæ, which run into each other when the eruption is copious, and give a uniform vivid redness to the surface (*miliaria rubra*). In the course of from twenty-four to forty-eight hours, they enlarge, and the contained fluid becomes whey-like, giving them a white or pearly appearance (*miliaria alba*). When the vesicles are very numerous, some of them unite, and form here and there vesicles of the size of a pea; and on some parts they are closely grouped into irregular patches of various sizes. In a few instances, some of these confluent vesicles become filled with a purulent fluid (*miliaria purulenta*). In some cases the eruption retains its red color throughout; and occasionally the vesicles are white from the commencement.

The miliary eruption appears in general as a symptomatic exantheme in vari-

ous forms of fever; "in continued, remittent, inflammatory and contagious, as well as other diseases;" and it has been much doubted whether it ever occurs as an idiopathic or independent malady. Bateman says, that "it is perhaps invariably symptomatic;" and this would seem to be the general sentiment at the present day. Cazenave, nevertheless, asserts, "that there are instances where it is idiopathic, as when it occurs in persons in good health after violent exercise during the heat of the summer;" and Richter expresses the same opinion.

The appearance of the eruption is almost always preceded by premonitory symptoms; such as a sense of anxiety in the epigastrium; weight and oppression in the breast, accompanied with a short dry cough; pains in the loins and extremities; a benumbed prickling sensation in the fingers; stinging, itching, and burning pain in the skin; a small, frequent, contracted and tense pulse; cephalalgia; vertigo; ringing in the ears; and a feeling of heaviness in the head; creeping chills; disposition to syncope; palpitation; twitching of the tendons; delirium. The most characteristic phenomena, however, is the profuse, sour, rank sweat, which is said almost invariably to occur just before and during the appearance of eruption. Sometimes, however, the miliary vesicles come out without any precursory symptoms whatever.* The eruption always appears first on the neck, breast, and on the inner surface of the arms; and then successively on the abdomen, back, and inferior extremities. The duration of the eruption is very variable. In some instances it disappears as early as the fifth or sixth day; but in the majority of cases desquamation does not take place until the ninth or tenth day, and occasionally not until a still later period. Not unfrequently the eruption of vesicles is repeated twice, thrice, and even a fourth time, so as to protract the whole course of the disease to the sixth or seventh week. In most instances new vesicles appear daily for five or six days, and longer. This eruption appears to be peculiarly liable to recede from the slightest causes; and the consequence of a sudden retrocession are often extremely alarming. Great anxiety in the præcordial region; extreme restlessness; increased febrile irritation; violent delirium; coma, or strong pulmonary congestion, with distressing dyspnœa, are among the consequences which are apt to result from this accident. If under these symptoms the eruption do not appear, or copious diarrhœa, or some other evacuation, do not ensue, a fatal termination will be almost inevitable. (Richter.)

This eruption does not appear to be the effect of critical effort in the system, or in any degree to diminish the general symptoms, if we except those miliary vesicles which sometimes occur towards the termination of rheumatic fever and gout.†

Causes.—That the miliary eruption is, generally, an artificial disease, has been long ago fully established. In the latter part of the seventeenth, and the commencement of the eighteenth century, when the alexipharmic, or heating and sweating plan of treatment was so much in vogue on the continent, miliary fevers of the most fatal character were among the most frequent diseases. As soon as the antiphlogistic and cooling method of treating febrile affections became more universally adopted, the miliary disease was but rarely observed; and it is now almost an unknown affection, except in its mildest form. By a stimulating, sweating, and heating treatment, miliary vesicles may be produced in every variety of febrile disease; and as such a plan of treatment is peculiarly apt to render even mild and manageable fevers dangerous and malignant, we may readily conceive how fatal the diseases must have been which were thus fomented into the miliary eruption. Sometimes, however, miliary vesicles make their appearance in acute diseases under the best regulated antiphlogistic treatment; and there can, I think, exist but little doubt that an eruption of this kind appears at times as an idiopathic disease. I have seen but few instances of this kind; but one case, which came under my notice within the present year, was apparently of this

* Richter, Specielle Thérapie, bd. ii. p. 541.

† Stoerk, Barretta, Dissert. de Miliaris Natura, &c., as quoted by Richter.

nature. The patient, a child, complained for a few days of slight indisposition, which was followed by an eruption of innumerable red points or vesicles. On the second day they became more distinctly vesicular and whitish, and continued until the fourth day before desquamation began. There was throughout the disease a constant moderate perspiration.

Cazenave and Schedel observe, that, "in certain cases of violent entero-colitis, accompanied with general debility, the miliary eruptions, which often occur at night during the paroxysms, present the next day a complete vesicular appearance, and the portion of skin which they cover is destitute of redness, and appears as if a multitude of minute drops of limpid water had been sprinkled over its surface."

The affections in which the miliary eruption is most apt to occur, are: puerperal fever; gastro-intestinal irritation or inflammation; inflammation of the serous membranes; rheumatism; and Richter says that females affected with severe leucorrhœa are particularly liable to this affection on the occurrence of febrile irritation. The occurrence of this eruption is said to be favored by a confined and damp atmosphere; excessive sanguineous and mucous discharges; insufficient and innutritious diet; acid and other irritating substances in the alimentary canal; and intemperance.

Treatment.—The attending fever must be treated according to its character and symptoms, without any regard to the miliary exantheme. In general the febrile irritation is sthenic, and requires an antiphlogistic treatment, and cooling regimen. In short, where the eruption is symptomatic, we must prescribe for the original malady, and not for the cutaneous affection. The idiopathic cases are mild, and require little more than gentle aperients, cooling drinks, and free ventilation, without, however, exposing the patient to a cold or humid air.

The diet, of course, must be mild and unirritating; and in instances which manifest much gastric derangement, a gentle ipecacuanha emetic may be given with advantage. When the eruption recedes, and unfavorable symptoms ensue, we should endeavor to recall it to the surface by warm bathing and mild diaphoretics—such as Dover's powder; and where the arterial action is low, by the internal use of carbonate of ammonia, infusion of serpentaria, camphor, and opiates.

Sect. V.—*Lichen.*

This affection is characterized by minute firm elevations or pimples, (papulæ), generally appearing in clusters, usually of a white color, sometimes red, and attended with considerable itching. Systematic writers describe many varieties of the disease.

Lichen simplex.—This disease almost invariably commences with transient flushes of heat in the face; lassitude; a slightly accelerated pulse, and occasionally severe headache; weakness; painful sensations in the stomach, and general febrile irritation. The eruption consists of red and inflamed miliary pimples, attended with heat and itching. In three or four days the redness begins to fade, and on the following day desquamation commences, which is usually completed in three or four days more, unless successive crops of papulæ appear, which sometimes occurs. In the chronic variety of simple lichen, the pimples are usually white, and but slightly or not at all inflamed. The eruption is preceded by moderate itching. The papulæ are seldom very perceptible, but in passing the hand over the skin it receives the sensation of a slight roughness from the small firm elevations on the surface. Its course is tedious, and of uncertain duration, lasting often several months. The skin becomes thickened, and at last exfoliates in large scales. *Acute* lichen occurs most commonly on the face and body; the *chronic*, on the extremities, more especially on the back of the hands.

In irritable habits it sometimes returns every summer. Persons subject to

gastric pains and headache, are sometimes affected with this eruption; as if by crisis, when these affections go off. (Bateman.) Sometimes the pimples occupy the roots of the hairs of the skin. (*L. pilaris.*) And in this case the disease generally continues long. In some instances the papulæ appear in patches or groups, well defined, and approaching to the circular form. (*L. circumscriptus.*) These spread at the same time that the central part heals and exfoliates, remaining, however, slightly red and scurfy. Occasionally the patches are livid, the pimples being soft and flat. (*L. lividus.*) These are sometimes mixed with dark red or purple maculæ from sanguineous extravasation, occurring most commonly on the lower extremities of relaxed debilitated subjects. The eruption is sometimes disposed into the form of a long stripe or band, extending in a spiral manner round an extremity. (*L. gyratus*, Biett, Cazenave.) At times the eruption consists of larger pimples than the usual size. (*L. urticatus.*) They are inflamed, prominent, large, confluent, "and resemble the stings of a nettle." They come out suddenly on the face or neck, particularly in young persons and females in the summer. A burning pain and considerable itching attend. They usually disappear in a short time, but often return at irregular intervals. (Cazenave and Schedel.) Infants at the breast are subject to a modification of this eruption. (*L. strophulus*,) in which the papulæ are "either redder or whiter than the skin, and attended with great itching, which is much increased by the heat of the bed." It is acute in its character, and subject to distinct exacerbations. (Cazenave.)

Lichen agrius.—This is conspicuously febrile; the eruption consists of a multitude of vividly red miliary pimples, aggregated into large patches, seated on a diffused erythematous surface. Itching, heat, and a sense of painful tingling, greatly increased by the heat of the bed, by active exercise, and stimulating ingesta, are experienced. Morning remissions and evening exacerbations occur. The skin around the patches is generally painful and somewhat swollen. The eruption and general symptoms usually increase until about the fourth or fifth day, when small ulcerations appear on the summit of the pimples, discharging a sero-purulent fluid, which concretes into small, yellow, prominent crusts. These finally fall off, and are succeeded by thin scales. The disease usually continues from twelve to fifteen days. The itching and stinging sensation in this variety of the disease is often extremely violent. In many instances the eruption appears and disappears several times before it finally goes off. The skin of the affected parts generally, at last, becomes harsh, chappy, and extremely painful when rubbed. This variety may terminate in *impetigo*, a chronic pustular affection. (Bateman.) When the eruption recedes, from exposure to cold, it is apt to be followed by an increase of fever, headache, vomiting, and colic pains. *Simple lichen* may assume this form of the disease. L. agrius is most apt to occur in young persons of vigorous and sanguineous habits. (Cazenave.) Lichen may also acquire a chronic character. In this case the cuticle becomes harsh, hard, full of fissures, dry and rough, particularly in the hollow of the articulations.

Causes.—Lichen occurs in persons of all ages, and in both sexes. Summer and spring are the seasons more favorable to its occurrence. High temperature, particularly the heat of the sun, is apt to excite it. Mental affections, stimulating potations habitually indulged in, gastro-intestinal irritation, and internal inflammations, are mentioned among its most obvious causes.

Diagnosis.—Simple lichen may be distinguished from *eczema* by its acuminated, solid, and very prurient pimples; the eruption of eczema consisting of transparent vesicles, attended only with slight smarting pain. From *scabies*, lichen may be known by the distinct vesicular character of the former, and its usual location on the bends of the joints and between the fingers. The vesicles of lichen are aggregated in clusters. From *prurigo*, lichen is distinguished by the flat, irregular appearance of the papulæ in the former, and their being usually lacerated, and covered with small blackish crusts. The itching and burning of prurigo are always extremely distressing; in simple lichen it is generally slight.

(Cazenave.) *Lichen circumscriptus* sometimes resembles *herpes circinnatus;* but may be known from it by the red, or more strongly inflamed state of the skin surrounding the margin of the latter, and the distinct papular character of the former, both in the centre and at the border of the patches; whilst in herpes the central disk is free from vesicles. Lichen urticatus may be mistaken for *erythema papulatum*, or *syphilitic lichen.* The diagnosis between them consists in the large size of the erythematous patches, their pale red color, the almost entire absence of itching, the less prominence, and their not appearing and disappearing several times in succession. The copper color of the papulæ of syphilitic lichen, their freedom from inflammation and much itching, and their slow progress and long continuance, distinguish it from L. urticatus. From *chronic eczema* lichen agrius is often not easily distinguished. The presence of lichen, however, may be known by the great itching, roughness and thickening of the skin, and the appearance here and there of distinct pimples.

Prognosis.—Lichen is never a dangerous, but sometimes an extremely troublesome and disagreeable affection. The precursory fever is seldom so great as to keep the patient confined, and in the majority of instances it is wholly absent. By violent friction and scratching, and sometimes spontaneously, severe excoriations and burning pain occasionally occur, which are almost always difficult to remove. When the eruption is repelled by improper applications, or by other injurious influences, as cold, severe fever, internal inflammations, great heat, thirst, fixed pains in the abdomen, vomiting, &c., sometimes ensue.

Treatment.—In the simple variety, tepid bathing; mild aperients; diluent acidulated drinks; abstinence from heating drinks, food, and exercise, are all that it is necessary to prescribe. Dry, irritating applications are improper—particularly sulphur, and the metallic oxides. To relieve the severe itching and burning in the affected parts, we may apply cream or wash the part with flaxseed tea, or some other mucilaginous fluid. When the affected parts become very red and irritated, attended with constant stinging pain and itching, a laxative dose of calomel may be given occasionally, and fresh, unsalted butter applied. In the chronic forms of the disease, alkaline and sulphurous baths, mild laxatives,* tepid bathing, at first with the water of scalded bran, "and afterwards with water rendered alkaline by adding subcarbonate of potash, in the proportion of half an ounce or an ounce to four or five pounds of water. Cazenave advises, in severe cases of this kind, anointing the eruption with one of the following ointments.† During desquamation, the internal use of the diluted sulphuric acid is often beneficial.

The treatment must be more active, however, in *lichen agrius.* Here sanguineous evacuations, both topical and general, are often necessary in the beginning of the complaint; but when blood is drawn by topical means, it must be taken from a sound part of the skin. (Cazenave.) Low diet, laxatives, diluted nitric or sulphuric acid taken internally, laxative doses of calomel, alkaline sulphurous baths in the decline of the malady, the internal use of Fowler's solution, with a gradual increase of the dose, until it produces gastric disturbance, are the means generally relied on in cases of this kind.

* ℞.—Calomel grs. xii.
Hydrarg. sulphur. nigr. grs. xxxvi.—M. Divide into 12 equal parts. S. Give one every other evening to a child of from 2 to 7 years old, with a small dose of ol. ricini on the following morning.

† ℞.—Calomel ʒss.
P. camph. grs. xii.
Axungiæ ʒi.—M. f.
Or—℞.—Protoioduret hydrarg. grs. xii. to ℈i.
Axungiæ ʒi.—M. f.

Sect. VI.—*Eczema.*

Eczema is a vesicular eruption, which occurs both in an acute and chronic form. Cazenave and Schedel divide acute eczema into three varieties, namely, *E. simplex*, *E. rubrum*, and *E. impetiginodes*.

1. *E. simplex.*—The eruption consists of innumerable small, closely approximated, transparent vesicles, without any surrounding inflammation, distributed over a greater or less extent of the surface—the skin everywhere retaining its natural color. No premonitory symptoms, but only a slight itching, precedes the eruption. The fluid in the vesicles soon becomes opaque, and after a short period is absorbed; the vesicles then shrivel, and the cuticle desquamates slowly. It never spontaneously gives rise to inflamed surfaces. This eruption is usually local, or confined to certain parts, commonly the arms and between the fingers, and being attended with severe pruritus, may be mistaken for the itch. Heating and irritating applications to the skin often produce this affection. "It often appears between the fingers of women in child-bed;" and in persons who are much exposed to the heat of a fire. It is sometimes associated with itch, and appears to be excited by the irritating remedies usually employed for the cure of that affection.

2. *Eczema rubrum.*—Heat, stiffness, and some tingling in the skin, precede the eruption in this variety. The affected surface is inflamed and vividly red, covered with very minute acuminated pimples of a shining white or pearly hue. After some time, vesicles of the size of a pin's head, surrounded with distinct red areolæ, appear on the affected parts. In the course of six or seven days, the contained fluid is absorbed, the vesicles shrivel and desquamate, leaving a pale red surface, sprinkled with minute rounded papulæ, each rising from a small whitish disk. In some instances the cutaneous inflammation increases, and continues beyond its ordinary duration; the vesicles become confluent, break, and discharge an irritating fluid which causes superficial excoriations; and at last, concrete into large, thin, pliant scales, leaving inflamed surfaces on falling off.

3. *Eczema impetiginodes.*—Violent inflammation, swelling of the affected parts, and vesicles generally congregated or confluent, filled with a *sero-purulent fluid*, are the principal characteristics of this variety of the disease. These purulent vesicles soon break, and the fluid concretes into soft, yellowish and often extensive scales, or thin crusts. When these fall off they leave red surfaces, exuding a reddish fluid, which dries into thin laminæ. The eruption is commonly confined to a particular part, or even a single spot. Occasionally, however, it occurs over the whole body, and is attended with considerable fever. The disease may continue from ten to twenty days, and upwards. The vesicles are generally transparent at first, and become pustular afterwards. This variety also sometimes assumes a chronic character, resembling then the chronic state of eczema rubrum.

4. *Chronic eczema.*—When acute eczema is very severe, it often terminates in chronic excoriations and fissures of the skin on different parts of the body, particularly in the bends of the knees and elbows, and about the axillæ. The parts thus irritated and inflamed, exude an abundance of serous fluid, which causes the linen to adhere to them. In this state it usually remains for several months, the discharge continuing undiminished. In some instances, the exuded serum dries into soft, yellowish, and thin crusts, leaving an inflamed and nearly dry surface when they fall off. "These crusts form at greater intervals; they become drier, and the disease seems on the point of disappearing, when, on a sudden, and without any assignable cause, the inflammation acquires greater intensity." New vesicles arise which, like the former, soon break and discharge their fluid; "and the affection goes through the same course, and the disease may thus last for years." (Cazenave.) Sometimes the thickened, red, fissured

skin remains dry, and the crusts are drier, more firmly attached, and of a brownish-yellow hue, leaving but a slightly red surface when they separate. Occasionally, indeed, the skin for a long time remains vividly red, cracked, with dry scales of altered cuticle thinly scattered over the surface. Chronic eczema commences on a limited portion of the skin, often not above a few inches in diameter, and spreads afterwards over a greater or less extent of the surface. The itching is always very great, and returns by spells, causing an irresistible desire to scratch.

The parts furnished with hair, the region of the pubis, the armpits, groin, scrotum, pudendum, and the bends of the joints, are most apt to become the seat of eczema, although every part of the body may become affected with it.

Causes.—Though not contagious, yet instances do occasionally occur in which this disease is communicated from one to another by protracted contact. (Biett, Cazenave.) It occurs more frequently in women than in men, and in the warm than the cold seasons. Its general cause is unknown. It may be excited by direct irritating applications to the skin, as a blister, sinapisms, turpentine, valerian root, the rays of the sun,* dry frictions, and irritating ointments, lime, and sugar.† The use of mercury, when long continued, sometimes produces a very severe variety of eczema.

Diagnosis.—Simple eczema often greatly resembles itch. They may be distinguished by the following circumstances. In eczema, the vesicles are flat or rounded; in itch, pointed; in the former they are nearly or entirely in contact with each other; in the latter they are single, and considerably separated. The itching of eczema is attended with smarting pain; in itch, the pruritus "is rather agreeable than painful."

The *impetiginode* variety of eczema has been confounded with impetigo. The former, however, occupies large spaces, the latter usually small ones. The eruption in impetigo is strictly pustular from the beginning. In eczema impetiginodes, it is vesicular at first, the vesicles being generally transparent, and never contain genuine pus, as they do in impetigo. In the latter, desiccation gives rise to thick, yellowish, uneven *scabs;* in eczema, only thin pliant scales are formed. Vesicles of eczema rubrum surround the latter, but they never appear in impetigo.

Chronic eczema is very liable to be confounded with *lichen* and *psoriasis.* Lichen agrius, the variety most apt to be mistaken for chronic eczema, differs from this affection in the thick, small, and yellow appearances of the scales or scabs, and the papular appearance of the surface which they leave on falling off; whereas, the surfaces left by the separation of the thin lamina in eczema, are smooth, red, often shining, and generally slightly excoriated. In lichen, small hard papillæ may be seen around the eruption; in eczema, vesicles only appear in the neighborhood of the eruption.

Treatment.—Diluents, acidulated with sulphuric or nitric acid; a light and simple diet; occasional tepid bathing; gentle laxatives; and where the eruption is extensive, alkaline and sulphurous baths,‡ with some of the milder vegetable tonics, such as infusions of cinchona, serpentaria, or colomba when languor or debility exists, are the principal useful measures in this variety of the complaint. When the eruption continues long, advantage may be obtained from rubbing the affected parts with sulphur ointment.

In *eczema rubrum* and impetiginodes, frequent bathing, or emollient fomentations of the affected parts, will generally moderate very considerably the itching

* The *prickly heat* or *heat spots* are classed with this variety of eruptions. (Willan.)

† Persons who are in the habit of handling or working in sugar are liable to an eruption of this kind on the hands, called the *grocers' itch.* (Bateman.) And bricklayers are subject to a similar affection from the irritation of lime.

‡ The alkaline bath is made by dissolving five or six ounces, or more, of the subcarbonate of potash or soda in a bath. The sulphurous bath is made by adding about four ounces of sulphuret of potash to a bath. (Cazenave.)

pain and tenderness of the eruption ;* emollient poultices also often answer well as a palliative application. After exfoliation, the following ointment may be beneficially applied to the tender and half-excoriated surface† by means of linen rollers renewed twice daily. Mild laxatives should be regularly given ; and a simple, unirritating diet, as well as total abstinence from all kinds of stimulating drinks, enjoined. It will also be useful to administer refrigerant diaphoretics, such as sweet spirits of nitre, small portions of nitrate of potash with tart. emetic, spiritus mindereri, and to allay nervous irritation and procure rest at night, full doses of Dover's powder with a few grains of calomel in the evening. The diluted mineral acids with tonic bitter infusions will at times be proper during the subsidence of the disease. All kinds of irritating applications must be avoided. When the exciting cause is obvious, and of such a nature as to enable us to remove it, the first step in the treatment must of course be to obviate its influence.

In *chronic eczema*, emollient baths of about the temperature of 90° Fahr. ; the internal use of nitric or sulphuric acid ; occasional laxatives, alkaline solutions internally, and when the itching is great, externally,‡ are among the principal remedies in this form of the disease. One or two of Plummer's pills,§ given twice daily, have been found very useful in chronic eczema. Benefit may also be derived from laxative doses of calomel and pulvis antimonialis, with an occasional dose of sulphate of magnesia or soda. Sulphurous waters, employed both externally and internally, will, in general, contribute materially towards the removal of the disease. Infusions of sarsaparilla, chimaphila, or of the slippery-elm bark, with small portions of antimony, may also be usefully employed. In a very severe and inveterate case of chronic eczema, I prescribed the following pills, in conjunction with sarsaparilla syrup, with complete success.‖ In the dry, scaly, cracked form of local eczema, "as it occurs in the hands," Cazenave recommends frictions on the part with an ointment made by mixing half a drachm of proto-nitrate of mercury with an ounce of lard ; or of twenty grains of proto-ioduret of mercury rubbed up with an ounce of axunge. I have known a case of this kind cured by the following application,¶ first recommended, I believe, by Alyon. (*Essai sur les Propriétés Méd. de l'Oxygene.*)

Washing the affected parts with an infusion of stramonium leaves, or of solanum nigrum, or hyoscyamus, will generally greatly allay the itching and painful irritation. When the eruption is confined to a limited surface, solutions of borax, lime-water and milk, or an ointment made by mixing half a drachm of calomel with an ounce of lard, may be occasionally applied with benefit. The

* The French are in the habit of using a decoction of bran, or the water of scalded bran, for this purpose. Cazenave and Schedel recommend cataplasms made of potatoes and some emollient decoction.

† ℞.—Emplast. plumbi ℥ii.
Ceræ flavæ ℥ss.
Olei amygdal. dulc. ℥ss.—Melt the plaster with the wax, then add the oil, and stir the mixture until it has entirely cooled. This ointment is particularly recommended by Dr. Pearson. —See *Bateman's Synopsis*, &c., p. 12.

‡ "Half a drachm of the subcarbonate of potash dissolved in a pint of infusion of chicory may be given internally." Washing the affected parts with a solution of the subcarbonate of potash or soda, before going to bed, will generally afford much relief. (Cazenave.)

§ ℞.—Calomel,
Antimon. sulph. præcipitat., ãã ℥ii.
Pulv. g. guaiac. ℥iv.
Sapo Venet. ℥ii.
Mf. pl., ãã grs. iii.

‖ ℞.—Muriat. hydrar. corrosiv. grs. iii.
G. opii grs. x.
G. camphor. grs. xx.
Conserv. rosar. q. s.—M. Divide into 40 pills. Take one every morning, noon and evening.

¶ ℞.—Axunge ℥viii. Melt it, then gradually add *nitric acid* ℥i., and stir until it is cold.

best local application, according to my own experience, however, is stramonium ointment intimately mixed with a portion of calomel, in the proportion of thirty grains of the latter to an ounce of the former. The tincture of cantharides is sometimes very efficacious in obstinate cases of this affection. Cazenave states that it is particularly useful in the eczema of women.* Arsenic also has been used with complete success in inveterate instances of chronic eczema. (Biett, Cazenave.) The Asiatic pills appear to be the best arsenical preparation in this affection. One of these should be taken daily, and continued for several months. I have employed Fowler's solution in several cases with marked advantage.

Sect. VII.—*Erythema.*

The termery thema is applied, by Willan and other late writers, to a cutaneous affection characterized by a slight, superficial, irregularly circumscribed redness of some portion of the skin, attended with symptoms of constitutional disorder. It is most commonly seated on the face, breast, and extremities, and continues usually from one to two weeks. It appears, generally, as a symptomatic affection—although in many instances it occurs without being preceded by any obvious constitutional symptoms. Superficial spots of a vividly red color, variable in size, and attended usually with very slight heat and pain, come out on a greater or less extent of the surface. When these spots are pressed with the finger, the redness disappears for a moment as in erysipelas. In some instances, not the slightest tumefaction attends; but in others, the spots become swollen and firm to the touch. Sometimes the bright red patches are irregularly rounded, and present, on their first appearance, a slightly elevated, rough or papulated surface. In a few days the redness becomes more vivid, and afterwards changes to a violet hue, particularly on the central parts of the patches. The slight swelling subsides in the course of the second day, but the redness continues from about ten to fourteen days. This variety of the disease (the *E. papulatum* of Willan) is most frequently met with in females and young persons, and is usually seated on the neck, breast, and arms. It is sometimes attended with much general disorder—such as anorexia; a small and frequent pulse; great depression of strength and spirits; and acute pain in the limbs. In most instances, however, the constitutional symptoms are slight. (Bateman.) In some cases "small slightly elevated tumors are interspersed through the patches," which continue six or seven days before they disappear—the redness going on for about a week longer. (*E. tuberculatum.*) This eruption frequently appears also in the form of red oval spots, usually seated on the anterior part of the legs, and sometimes, though rarely, on other parts—as the chin and arms. The spots become elevated towards the centre, and are firm and painful to the touch, presenting the appearance of slight nodes when seated on the tibia. These protuberances rise slowly, and subside about the eighth or ninth day, at the same time that their color becomes bluish, as from a bruise. This variety of the disease is preceded for four or five days by moderate fever, general uneasiness, and depression of strength. Bateman says that it seems to occur only in females; but Cazenave and Schedel state that it is met with also "in infants, and in young persons of a weak constitution and lymphatic temperament." This variety constitutes the *E. nodosum* of Willan. The erythematous spots which sometimes occur in acute diseases as symptomatic eruptions, (*E. fugax,*) are usually of short duration, and resemble the redness

* Cantharides have been successfully employed in various chronic cutaneous affections. Keir relates several very obstinate instances of *impetiginode* affections which yielded to a protracted course of this remedy. (*Voigtel's Arzneimittell.*, bd. ii., *Abth.* ii. s 15.) Home also gave it successfully in herpetic affections. (*Clinical Experiments*, &c.) Tilenius (*über die Flechtenart. Hautauschl.*, 1802) and Simons (*Med. Comment.*, vol. i.) relate instances of its successful employment in similar cases.

produced by pressure or friction. They occur also in chronic affections, "especially those in which the primæ viæ are deranged."

Causes.—Erythema may be produced by the direct action of irritating agents on the skin, such as the direct rays of the sun; acrid secretions or discharges remaining long in contact with the skin; and by the chafing of two contiguous surfaces, as between the breasts, in the arm-pits, groin, and on the buttocks and internal parts of the thighs from riding on horseback. It occurs symptomatically from intestinal irritation, dentition, menstrual irregularities, particularly about the decline of the menses, from irritation in the stomach, and in almost every form of acute disease. It is sometimes associated in œdema, or anasarca of the legs.

Diagnosis.—From erysipelas, erythema is distinguished by the limited extent of the spots; the absence of pain, of vesication, and of tumefaction; and the mild nature of the disease. From *roseola* it differs in vivid redness, and in the less distinctly defined circumference of its spots or patches. The spots of roseola are never raised above the surrounding skin; those of erythema nodosum are. Erythema papulatum may be known from *urticaria* by the greater elevation of the latter, and the great itching which always attends, as well as by its "irregular and often rapid course." The absence of itching in erythema distinguishes it also from *lichen urticatus.* (Cazenave.)

Treatment.—Light diet, gentle diaphoretics, the internal use of the mineral acids, laxatives, warm baths, tepid ablutions, and soothing applications when it occurs from the friction of surfaces, such as aqueous solutions of borax, opium, acetate of lead, or pulverized starch, or the powder of lycopodium, comprise all that is necessary in idiopathic erythema.*

Sect. VIII.—*Roseola.*

This affection consists of rose-colored spots of various forms, without swelling or elevation of the skin or papulæ, and is usually preceded and accompanied by febrile symptoms. These efflorescences may occur over the whole surface of the body, but they are usually confined to one or more parts. Its course varies in duration from one to about six or seven days. Sometimes the rose-red spots are nearly circular, contiguous to each other, and not above three or four lines in diameter. They are usually connected with disorder of the stomach and bowels, and occur almost exclusively in infants; and they seldom last longer than thirty-six hours. During dentition these spots are apt to assume an irregular and nearly confluent appearance, and generally succeed violent symptoms of gastro-intestinal disorder, such as vomiting, diarrhœa and fever.

There is a variety of this eruption which has been mistaken for measles, and which is most apt to occur in children during summer. (*R. æstiva.*) It commences with chills, languor, headache, followed by febrile reaction, and occasionally delirium, and even convulsions. The skin is hot and dry, the bowels are constipated or affected with diarrhœa, and the appetite wholly depressed. From the third to the seventh day after the commencement of these symptoms, the eruption makes its appearance, first on the face and neck, and then gradually spreads over a greater or less extent of the surface of the body. The spots are usually from one to three lines in diameter, resembling the spots produced by touching bibulous paper with the point of a pen dipped in red ink. When the eruption is very copious, the spots run into each other on some parts of the body, but the roseolous points may still be distinguished on the red surface.

* To relieve the inflammation and tenderness produced by chafing, the following ointment, applied by strips of soft linen, is often promptly effectual:

℞.—Ungt. stramonii ℥i.
Pulv. lythargyri ℥i.
Pulv. opii ℥ss.—M.

These spots are not in the slightest degree elevated, yet when the patient has been kept too warm, or when heating diaphoretics are used, a papular eruption is apt to appear along with the roseolous spots. The eruption is attended with troublesome itching, and the febrile irritation continues until it disappears with the eruption. It is often attended with sore throat, or painful deglutition, but not with coryza, inflamed eyes, and cough, like measles. The spots may continue from three to ten days; they disappear without desquamation. Occasionally a second eruption occurs after the first has gone off.

In some rare cases, the rosy spots assume an annular shape, the central parts retaining the natural color of the skin. (*R. annulata*, Willan.)

Roseola occurs most frequently in women and children, and is not contagious. It occasionally prevails epidemically, and sometimes precedes the eruption of small-pox, or it follows the vaccine affection. Dentition, and a draught of cold water when the body is heated by exercise, may give rise to this eruption; and it is often associated with gastric disorder, particularly in children.

Diagnosis.—Measles and scarlet fever are the affections with which roseola is most liable to be confounded. The more distinct catarrhal character of measles, the irregular semilunar grouping of its *small* red points, and the vivid redness of its eruption, contrasted with the larger, more circular, well defined, and *rose* red spots of roseola, will generally enable us, without difficulty, to form a correct diagnosis. The small vesicular elevations, the irregularly diffused *raspberry* efflorescence, and the tumefaction of *scarlatina*, are usually sufficient to distinguish this affection from *roseola*. Roseola is not contagious; measles and scarlatina are.

Prognosis.—This disease is almost always wholly free from danger. Heim,* Selle,† and Formey,‡ however, mention the occurrence of very violent and fatal epidemics of this kind. But in these the eruption was probably purely symptomatic of typhus fever. Hildebrandt refers to an exantheme, somewhat similar to this one, as a very constant, though transient symptom, in the stage of excitement of contagious typhus.

Treatment.—Rest, mild aperients, acidulated cooling diluents, a simple and unirritating diet, an equable and moderate temperature; and where the temperature of the skin is elevated, refrigerant diaphoretics, are, in general, all that is required in the treatment of this affection. When internal inflammations occur, a more vigorous and appropriate course will be demanded.

Sect. IX.—*Purpura.*

Hæmorrhœa Petechialis, Ecchymome, Hæmacelenose.

This affection is characterized by spots or patches of a vivid red, inclining sometimes to a purple hue, varying in size from a line to several inches in diameter, and retaining their color under pressure. These maculæ appear often without any perceptible febrile phenomena whatever; but they occur also in the latter stage of malignant fevers, (*petechiæ*,) and in this case are always of the most fatal import. Willan has divided purpura into five species; *purpura simplex; purpura hæmorrhagica; purpura urticans; purpura senilis;* and *purpura contagiosa.*

Simple purpura consists in small bright red patches, appearing usually on the extremities in a successive manner, preceded commonly with slight restlessness, nausea, headache, languor, and want of appetite, but without any obvious irritation of the circulatory system. The duration of this affection is almost always tedious, and varies from a few weeks to many months. The individual spots,

* Bemerk, über die Verschieden. des Sharlachs, der Roethel und der Masern.
† Neue Beiträge zur natur-und Arzneiwissenschaft, tem. i.
‡ Topographie von Berlin, Richter, Specielle Thérapie, bd. ii. p. 524.

however, do not often continue for more than seven or eight days—the whole course of the malady being made up either by a continuous succession of the eruption, or a succession of eruptions, with short intervening periods.

This variety of the disease occurs usually in young subjects, and appears equally liable to attack vigorous, sanguineous, and robust, as well as feeble, relaxed, and delicate individuals. It is said to appear more frequently during warm and dry weather, than in the cold seasons. Its *diagnosis* is not difficult. The persistence of the redness when pressed with the finger, is alone sufficient to distinguish it from all other similar affections. Simple purpura is always a mild affection, and though sometimes very prolonged in its course, can never be regarded as dangerous.

P. Hæmorrhagica.—The variety of purpura, however, which has attracted the most attention, and which, indeed, is always a very serious and alarming affection, is the *purpura hæmorrhagica*—or *morbus maculosus hæmorrhagicus* of Werlhof. The spots in this variety are generally numerous, and of a dark red color, with here and there irregular livid patches resembling recent bruises. They usually appear first on the legs, then on the arms, and lastly on the body; the hands almost invariably remaining free from them. In some instances the cuticle over these maculæ becomes slightly elevated, with a small portion of bloody serum underneath.* These spots occur also on the mucous surfaces, particularly in the mouth, nostrils, rectum, or vagina, giving rise to hemorrhages, sometimes so copious as to cause speedy death. In general, however, the hemorrhage is moderate, returning at intervals, and either ceases spontaneously, or recurs again and again until the system is exhausted, and a fatal termination occurs; sometimes a slight but *uninterrupted* discharge takes place. The constitutional symptoms vary exceedingly in this affection. Some cases commence with wandering and vague pains, lassitude, restlessness, and exhaustion; others are not preceded by any symptoms of general indisposition. In general, however, the disease, when once developed, is accompanied with a state of depression and languor; yet in relation to the *activity of the pulse*, the greatest diversity occurs in different cases. In some instances it is feeble, soft, and moderately full; in others it is contracted, firm, and very frequent; and in others, again, active, full and resisting. The skin is sometimes above the natural temperature,† though generally it is cool and pale. Cough, pain in the chest, and slight oppression of respiration, frequently precede and accompany the cutaneous and hemorrhagic affections. Dr. Fairbairn relates a case attended with deep-seated pain in the left breast, increased on coughing and deep inspiration, laborious breathing, and flushed countenance. Dark, venous blood oozed from the gums, cavity of the mouth, and apparently from the mucous membrane of the bronchiæ; and numerous petechiæ or purple spots appeared on the arms, neck, and trunk.‡ Uneasiness in the stomach with abdominal pain, or tension and weight in the hypochondria, sometimes precede the appearance of the spots. When the disease becomes protracted, more or less anasarcous tumefaction of the legs and face, emaciation, and great weakness and languor supervene. The duration of this malady is as various as the general phenomena which accompany it. It may terminate either in health or in death, within a few days from its commencement, or run a tedious course of many months. The fatal termination of this affection is frequently the immediate consequence of profuse hemorrhage from some internal organ. Cazenave states that he has "seen patients suddenly expire from copious hæmoptysis, as well as from hæmatemesis and intestinal hemorrhage." The spots or maculæ are caused by the extravasation of blood under the cuticle.

* I. G. Arcel (C. Zetterstrom), Diss. de Hæmorrhœa. Upsal, 1797.

† See Dr. Gardiner's case—Edinburgh Med. Chir. Transact., vol. i. p. 671. Also Dr. Fairbairn's case, quoted below.

‡ Transact. Med.-Chir. Society of Edinburg, vol. ii. art. 1.

Concerning the etiology and pathological character of this remarkable affection, we know, as yet, but little that is satisfactory. Dr. Parry regarded the disease as being decidedly phlogistic, whilst most other writers ascribe it to an opposite character. It is certain, that notwithstanding the extraordinary tendency to hemorrhage—apparently of the passive kind—the blood drawn with the lancet sometimes coagulates strongly, and exhibits a sizy, and even a cupped and buffy surface.* It is equally ascertained that extensive internal inflammations are sometimes connected with this malady. In the case reported by Dr. Chambers, (*Med. and Phys. Journ.*, Nov. 1826), "the convolutions of the small intestines were found agglutinated by adhesive inflammation, and the whole arachnoid membrane on the upper part of both hemispheres was covered with lamina of coagulated lymph." More commonly, however, the blood taken by venesection presents none of the appearances indicative of a phlogistic condition. "In many persons who were examined after death in the hospital St. Louis," says Cazenave, "the blood was found in a state of remarkable fluidity." In Dr. Fairbairn's case, the blood coagulated "into a soft and tremulous mass;" and in the case reported by Dr. Gardiner, the first blood drawn coagulated imperfectly, and on the following day resembled a tremulous jelly, with a greenish surface interspersed with brownish spots. What was discharged afterwards "was more like turbid lymph, or a fluid in which some reddish coloring matter was suspended."

In the majority of instances, marks of violent venous congestion,† with copious extravasation of bloody serum or dark liquid blood into the internal cavities, are detected on post-mortem examination. Petechiæ, too, are often met with on the internal surfaces, particularly on the mucous membrane of the lungs, intestines, stomach, (Fairbairn, loc. cit.,) and fauces. In some instances almost the whole capillary system takes on the hemorrhagic action—every structure, whether membranous or parenchymatous, presenting marks of sanguineous extravasation.

Under all this perplexing contrariety of phenomena, our reasonings and conclusions respecting the fundamental pathological character of this affection must necessarily be vague and unsatisfactory. That it is not essentially an inflammatory disease, though often connected with local inflammation and an active state of the circulation, appears, I think, extremely probable. It is indeed true, that in some of the most violent forms of inflammatory fever, colliquative hemorrhages and subcutaneous extravasations of blood occur; but these do not supervene until the general powers are prostrated, or a state of collapse is induced by the previous excessive excitement. In *purpura*, however, the petechiæ and sanguineous discharges are sometimes among the first signs of indisposition; and are but very rarely preceded by symptoms of strong vascular or phlogistic action. Dr. Stocker thinks that this affection is attended with an altered and unhealthy state of the blood, "either from want of due preparation of the fluid at the two chief sources of supply, and of the subsequent changes these fluids should undergo in their passage through the pulmonary, sanguiferous, and hepatic systems, or from the injurious effects of diseased functions in the organs of sanguification."‡ That a dyscrasy of the blood exists in this disease is, indeed, not at all improbable; but whether this condition of the blood has a direct and principal agency in the production of the characteristic phenomena of petechiæ and hemorrhage, or whether it is only one of the ultimate consequences of the primary and essential disease, is altogether uncertain. To me it seems probable that this affection has a considerable latent period before it manifests itself by external

* Dr. Stocker, Pathological Observations, &c., part i. p. 36. Parry's Posthumous Works, vol. i. p. 220. See also Dr. Chambers' case.—*Med.-Chir. Rev.*, Jan. 1827, p. 201.

† The lungs are sometimes greatly engorged with sanguineous extravasation and congestion. M. Biett saw an instance of violent venous congestion of the tongue. It was of a deep livid color, and double its natural size. (Cazenave and Schedel.)

‡ Loc. cit., p. 40.

symptoms; that primary disorder of the assimilating functions deranges the healthy constitution of the blood; and finally, that the blood, deteriorated or changed, being no longer possessed of its healthy relations with the organic sensibility of the capillary vessels, causes these to suffer its ready transmission and extravasation.

Treatment.—The uncertainty which exists in relation to the pathology of this disease, leaves us of course in an equally unsettled state with regard to the principles of its remedial management. The most opposite plans of treatment have been recommended, and practiced too, with occasional success. It would seem even that the existing symptoms are often a very fallacious guide; for in some cases marked with all the usual symptoms of general debility, relaxation, and asthenia, the use of tonic and other invigorating means has almost immediately aggravated the disease. Nevertheless, where the disease occurs in old persons or children, enfeebled by previous diseases, privations or other debilitating influences, a moderate tonic and exciting plan of treatment, with an invigorating regimen, has been found most beneficial. Decoctions of cinchonia, serpentaria, or rhatany; the ferruginous preparations; mineral acids, particularly the sulphuric; wine, and a nourishing diet, may be employed in cases of this kind. The only instance of this disease which has come under my notice, was in a child about seven years old. In this case I employed the nitrate of silver, in quarter grain doses, every six hours, together with from fifteen to twenty drops of the spirit of turpentine, with complete success. The case continued for nearly three weeks before it yielded to this treatment.

When the disease appears in adults of good and sanguineous constitutions, and who have not been previously subjected to the influence of enervating causes, tonics and exciting remedies almost invariably do great mischief. In all instances in which there are manifestations of strong visceral congestions, or of inflammation; where there is pain in the chest, in the epigastrium, hypochondria, or the abdomen; where there are evidences of intestinal irritation, or constipation exists; where the pulse is firm, corded, or tense, antiphlogistic measures should be adopted. *Bleeding* is recommended by Parry, and cases have been reported illustrative of its occasional beneficial effects. A case is reported as having occurred in Bartholomew's Hospital which strikingly illustrates the occasional usefulness of blood-letting in this affection. The whole surface of the body was sprinkled over with purple spots. The gums were spongy, livid and bloody.—"The whole tongue, also, was livid, and half of it presented the appearance of a large, black, bleeding fungus, shooting from its surface." Nothing but blood passed by stool. The patient nevertheless felt strong, and had a good appetite. Dr. Latham drew fifteen ounces of blood, which was very buffy, enjoined water gruel, and administered mercurial purges. The patient, under this management, gradually recovered.*

Where the disease is attended with an active state of the circulation, or with symptoms of visceral congestion or inflammation, bleeding may be practised with a prospect of advantage. It is a measure, however, which requires cautious employment even where it seems to be most clearly indicated; for the natural tendency of the disease to exhaustion and prostration is always great, and may readily be injuriously promoted by incautious abstractions of blood.

Whatever may be thought of blood-letting, almost all writers agree in recommending *purgatives* in this affection. Dr. Harty states that after he had failed in one case by tonic remedies and a nourishing diet, he resorted to the free administration of purgatives in upwards of a dozen cases, and, he avers, with uniform success. (Bateman.) He gave active doses of calomel and jalap daily.—Of late years the *oil of turpentine*, in purgative doses, has been strongly recommended as a remedy in purpura. Dr. Whitlock Nicholl has reported three cases in which this article was administered with the most satisfactory result.† To a

* Med.-Chir. Rev., May 1828. † Lond. Med. Repository, July 1821.—Ibid., No. vi.

child only two years old he gave half a drachm of the oil with some syrup and water, thrice daily, for ten days in succession. Under this remedy, the disease, though very violent, gradually yielded. Cinchona was at the same time freely used. Dr. E. Thompson also gave small doses of turpentine and castor oil with complete success.* Dr. Belcher used turpentine enemata with manifest advantage.† The turpentine, with castor oil, generally causes large, unnatural, and very fetid alvine discharges; and if the system is, at the same time, supported by tonic infusions, generous wine, and the mineral acids, nothing need be apprehended from the exhausting effects of daily purging with this mixture.

According to the report of Cazenave and Schedel, the treatment usually adopted in the management of this disease by M. Biett, consists in the employment of acidulated drinks and laxatives; and in cases attended with much feebleness and exhaustion, the extract of rhatany, (in doses varying from a scruple to a drachm daily,) mixed with ice. This treatment is also recommended by other eminent French practitioners. (Dr. Brachet, of Lyons.)‡

Local applications have been recommended to restrain the hemorrhages, but these rarely afford any other than very temporary advantages. Upon the whole, therefore, moderate blood-letting, where there are strong congestions, or an active pulse, purgatives freely and almost daily employed, together with cinchona, rhatany, *tinct. cinnamon*,§ wine, beverages acidulated with sulphuric acid, and a nourishing diet, constitute the means which experience has found most apt to afford relief in this affection. Advantage might, perhaps, be obtained from bathing the body in a decoction of oak bark or cinchona, or water strongly impregnated with salt.

CHAPTER XIX.

VASCULAR IRRITATIONS WITH A FLOW OF BLOOD.

Hemorrhages.

Spontaneous hemorrhage may be defined, a disordered state of the vital properties of a greater or less extent of the capillary system, manifesting itself by sanguineous effusion or extravasation.‖ It was formerly supposed that hemorrhages depend invariably on rupture of a blood-vessel; and this opinion is, indeed, still entertained by some pathologists. Dr. Gregory seems to take it for granted that actual rupture of a vessel takes place in all hemorrhagic effusions.¶ That this may sometimes occur, cannot be doubted; but this is probably so seldom the case, as to form but a very limited exception to the general fact, that the effusions of this kind depend on a sort of sanguineous exudation, without rupture or structural lesion of the vessels. In what manner, or through what particular openings, the blood is suffered to escape from its proper vessels, is, however, still a matter of conjecture, or at best of uncertainty. According to Bichat, the blood is discharged though the exhalents; and Reil supposes that it transudes through the coats of the vascular extremities, (*per diapædesin*,) from deficient vital power in these structures, just as we sometimes find the bile percolated through the cystic coats on post-mortem examination, or by what Dutro-

* Ibid., No. cxix. † Med. and Phys. Journ., March, 1825.
‡ Cazenave, &c., Synopsis, p. 379.
§ Jahn. Klinik der Chron. Krank., bd. p. 308.
‖ Bichat, General Anatomy, vol. ii. Reil, Fieberlehre, bd. iii. p. 23.
¶ Elements of the Theory and Practice of Medicine, vol. i. p. 517. Second American ed.

chete calls *exosmos*, through the agency of animal galvanism. When we take into view the results of some late physiological experiments, which go to show that the veins *imbibe* fluids into their cavities apparently through the insensible pores of their coats, it does not appear extravagant to suppose, that under particular circumstances, they may also give exit to their contents through the same channels. It is nevertheless most probable that the effusion occurs, (*per anastomosin*,) through the exhalents, in the manner so ingeniously explained by Bichat. In consequence of a morbid change in the activity of the sanguineous capillaries, as well as in the specific sensibility of the serous exhalents, the blood passes from the former to the latter, and by these is suffered to escape externally. Whatever doubts and exceptions may have been expressed by some recent physiologists with regard to the agency of what this eminent writer terms *organic sensibility* in the development of diseases, there is much foundation for believing that this pathological principle lies at the root of many of the morbid phenomena of the capillary system. It would be foreign, however, to the scope of this work, to enter into a particular discussion on this head. Those who may desire to obtain a full view of the facts and arguments that may be adduced in support of this pathology of hemorrhages, may consult the chapters on the capillary and exhalent systems in Bichat's *General Anatomy*.

Pathologists have divided hemorrhages into *active* and *passive*. A hemorrhage is said to be *active* when there is a preternatural flow of blood to the part, attended with an increased vascular excitement. In many cases, the whole circulatory system is in a state of increased activity; but the local vascular excitement often approaches, and indeed actually rises to the grade of inflammation, as in the spitting of blood in pneumonia, or the sanguineous discharges in dysentery. The local hemorrhagic irritation is, however, not always accompanied with an increased momentum of the general circulation. On the contrary, strong local determinations, and an active hemorrhagic excitement, often exist in an organ, whilst the activity of the heart and arteries is depressed, and the general powers of the system languid. Thus active hæmoptysis and uterine hemorrhage often occur in persons of weak and irritable habits, with a small, weak, and frequent pulse.

Active hemorrhages occur most frequently in young, plethoric, and irritable persons, and in those who are constitutionally predisposed to strong, irregular determinations of the blood to particular organs, as the head, the lungs, or the abdominal viscera. They occur in inflammatory fevers, either as accidental or *critical* evacuations; and in this case they are always to be regarded as favorable.

In many instances, the eruption of the blood is preceded by various premonitory symptoms; but in others, the hemorrhage comes on suddenly without any manifestations of its approach whatever. Among the symptoms which announce the approach of active hemorrhages may be mentioned a full, frequent, rebounding (*dicrotus; bis feriens*,) pulse; alternate flushes of heat and chills; redness, tension, and fullness of the skin; increased sensibility of the sensorial organs; restlessness; anxiety; watchfulness; slight aberrations of the mind; a feeling of heaviness, pressure, heat, and pain in the part; and in some instances, a turgid state of the veins, redness, and swelling in external parts remote from the organ from which the blood is about to flow.

Hemorrhages are called *passive* when there is neither sanguineous congestion, nor a sense of heat and fullness, but a *decreased* instead of an *increased* vascular activity, both of the general system and of the part from which the hemorrhage occurs—the exhalents suffering the blood to escape passively from want of vital activity to resist its entrance and transmission.

Some have contended that all hemorrhages are necessarily active; that the blood is always thrown out by an *action* of the exhalents, and not merely forced through them, as through passive tubes by the *vis à tergo*. This may be true; and yet when we find some chronic hemorrhages, connected with great feebleness and relaxation, speedily arrested by remedies which all physicians are accustomed to regard as the most energetic means we have for stimulating or exciting

these very vessels to increased activity, we cannot be much out of the way if we call such discharges *passive*. In that variety of chronic hemorrhage which occurs in relaxed and debilitated females at the critical period of life, we possess no medicine which so promptly and safely arrests the discharge, as small doses of aloes and savin in combination—the very remedies, too, which we often find most successful to excite the menstrual evacuation; in other words, the uterine vessels.

This variety of hemorrhage depends either on mere relaxation and inactivity of the vessels, without any morbid changes in the constitution of the blood, in consequence of previous disease, excessive discharges of all kinds, and other exhausting influences, or it is connected, and probably in a great degree dependent, on a thin, watery, or dissolved state of the blood, and therefore incapable of communicating healthy impressions and activity to the general and capillary systems of vessels. This state is always attended with a variety of symptoms besides the hemorrhage, indicative of a relaxed, exhausted, and sometimes irritable condition of the system.*

Of this kind of hemorrhage (*passive*) are those which occur in some chronic affections, attended with great relaxation, exhaustion, and morbid irritability, such as scurvy; and in the stage of collapse of malignant and other typhous forms of febrile diseases.

In some instances, the hemorrhage partakes of both the active and passive characters just mentioned. The vessels of some particular part may be habitually debilitated, inactive and relaxed, and consequently especially predisposed to congestion. If in this state some accidental circumstance supervenes, which increases the general momentum of the circulation, or particularly favors the determination of blood to the debilitated vessels, a hemorrhage may occur, attended both with general vascular activity, and local torpor and relaxation. This occurs sometimes in *hæmorrhois*.

The *effects of sanguineous discharges* on the system are of course various, according to the suddenness and quantity of the evacuation, their duration, and the constitutional habit of the patient. The immediate effects of a considerable loss of blood on the heart and arteries need not be particularly enumerated. When the hemorrhage is excessive, the respiration becomes quick and difficult, the skin pale and cool; tremors of the extremities, chills, ringing in the ears, dimness of sight, and finally syncope, ensue. When fainting occurs, the bleeding usually ceases. In violent cases, the syncope may terminate in immediate death; but such a termination is by no means common in spontaneous hemorrhages. More or less reaction usually soon returns, and the bleeding either remains permanently arrested, or reappears with diminished activity, continuing, in some instances, with occasional intermissions, until the whole system becomes greatly relaxed and exhausted.

The *secondary effects of profuse or long-continued discharges* of blood are often very alarming, obstinate, and even fatal. These remote consequences of hemorrhage are, indeed, among the most important circumstances connected with sanguineous discharges, whether they be considered in a pathological or practical point of view, and deserve the greatest attention.

After the immediate exhaustion of a profuse or protracted hemorrhage has in some degree gone off, the whole system is sometimes left in an extremely excitable state. The pulse becomes very frequent, throbbing, sharp, moderately full, and compressible; the least corporeal exertion or mental excitement produces agitation, strong beating of the carotids, palpitation of the heart, hurried respiration, and throbbing along the course of the abdominal aorta. In some instances of this kind, the arterial reaction becomes still more vehement. A pulsating, deep-seated pain in the head, and a high degree of morbid sensibility of the brain occur—manifested by great intolerance of light and sound, and occasionally more

* Jahn. Klinik der Chron. Krankheiten, bd. iii. p. 272.

or less delirium, with other manifestations of cerebral irritation. This state of tumultuous reaction and general irritability sometimes gradually subsides, and health slowly returns. In individuals, however, of weak powers of constitutional resistance, this secondary excitement is apt to terminate in a state of great feebleness and exhaustion. The patient becomes sluggish both in mind and body; he is disposed to doze, and is inattentive to surrounding objects; the face acquires a peculiarly pale and slightly tumid appearance: the pulse is frequent, irregular, and though often large, feels as if the artery were filled with wind. The muscular powers are greatly prostrated; respiration is difficult, interrupted by deep sighs, and attended with a peculiar *crepitus*, changing finally to a slight, rattling sound in the trachea and bronchia. In cases of this kind death sometimes supervenes, apparently from infusion into the lungs; in other cases cerebral oppression, coma and insensibility precede for several hours the fatal termination.*

In many instances, however, the morbid consequences of hemorrhages are of a much more chronic character. When the blood-vessels are much drained by copious or protracted sanguineous discharges, absorption always goes on very actively.† They soon become replenished, therefore, with a crude and watery fluid; the blood is greatly attenuated—containing often but a few ounces of cruor in a pound of the fluid. In consequence of this state of the blood, the heart and arteries are irritated; all the animal and organic functions become enfeebled and sluggish; the face and inferior extremities become more or less œdematous; and the whole surface acquires a peculiarly pale, exsanguineous, leucophlegmatic appearance; the mind is torpid; the countenance anxious, or vacant and apathetic; the heart palpitates strongly on the slightest exertion; the hands and feet are cold; the thirst usually very considerable; and the appetite variable, and attended with gastric pain or uneasiness, flatulency, sour eructations, and other dyspeptic symptoms. If the urinary secretion is small, general anasarca, or other forms of dropsy ensue; or colliquative hemorrhage may return, and finally extinguish life.

Causes.—The degree of constitutional predisposition to hemorrhagic discharges varies much in different individuals. Some persons appear to be particularly indisposed to spontaneous hemorrhage; whilst others, on the contrary, are naturally very prone to discharges of this kind, although in other respects of vigorous and healthy constitutions. In some individuals, there exists so great a constitutional hemorrhagic predisposition, that the slightest wound of the skin is apt to cause the most alarming discharges of blood, and which no applications are, in some instances, able to arrest. It appears, moreover, that this extraordinary tendency to hemorrhage is sometimes hereditary. Fordyce relates the case of a man who bled almost daily from the nose. All his children were extremely subject to epistaxis, and one of them died of this affection. Several very remarkable instances of this kind are reported in the second number of the *American Medical Review.*

It appears, also, that the predisposition to the different varieties of hemorrhage varies with the age of the individual. During childhood, hemorrhages are most apt to occur from the nose; between puberty and the thirtieth year of age, hæmoptysis would seem to be most common; in middle life, hemorrhage from the rectum occurs most frequently; and in very old people, hæmaturia is not uncommon.‡

* Dr. Marshall Hall. Medical Essays, p. 41.

† The experiments of Magendie and others have fully demonstrated this fact. Under the head of dropsy, I have entered more fully into the pathological circumstances which result from this principle.

‡ Cullen's First Lines, vol. ii. The explanation of these circumstances, as given by Cullen, though ingenious and plausible, is far from being satisfactory. It rests too much on the mere mechanical or hydraulic character of the blood-vessels. The intimate relation subsisting between the nervous and vascular systems, as vital structures, and the various sympathetic relations between the different organs themselves, subject to variations according to age, are probably

With regard to the occasional or exciting causes of hemorrhages, it may be observed, that whatever is capable of producing strong local determinations to soft and very vascular structures, particularly the mucous membranes, may give rise to effusions of blood. The following are the principal causes of this kind: High atmospheric temperature suddenly succeeding cool and damp weather; sudden diminution of atmospheric pressure—hence the aptitude to hæmoptysis and epistaxis on ascending high mountains. Various causes tending to obstruct the free return of the blood to the heart; such as ligatures, tumors pressing upon large venous trunks, tight cravats, visceral indurations, and tightly laced corsets; cold repelling the blood from the surface to the internal vessels. Causes that suddenly and greatly increase the momentum of the general circulation, as violent exercise, lifting heavy weights, stimulating ingesta, and violent mental excitement. Exertions that agitate or over-exercise particular organs, as loud singing, long-continued speaking, vehement laughing, blowing wind instruments. Substances irritating particular organs, such as cantharides and turpentine acting on the kidneys, sternutatories, or acrid and stimulating inhalations irritating the respiratory organs. General plethora, and obstructions of habitual sanguineous evacuations, particularly amenorrhœa. Finally, gastro-intestinal irritation, giving rise to strong determinations to the chest or head.

Hemorrhages of the *active* kind frequently occur as *critical* evacuations; more especially in the synochal grades of fever. *Passive* sanguineous discharges are never critical, or, more correctly speaking, perhaps never appear in connection with a favorable change of the malady in which they occur.

In some instances, hemorrhagic discharges occur periodically. Medicus has collected a number of examples of this kind in his work on periodical diseases.* Cases occur, also, in which the hemorrhage observes a strictly intermittent course—the bleeding returning daily about the same time, and continuing from a few minutes to several hours.† I have met with a case of intermitting epistaxis which continued to recur daily for nearly a week. Récamier has related a case of epistaxis in which the bleeding returned every morning and evening for six days in succession.‡

Prognosis.—The prognosis in hemorrhages depends on the constitutional habit of the patient; the suddenness and copiousness of the discharge; the nature of the organ from which the bleeding occurs; its independence, or connection with local or general disease; the character of the disease with which it may be associated; the period of febrile disease at which it supervenes; and the character of the occasional causes. Hemorrhage is not often fatal from the mere loss of blood. In the course of twenty-two years' practice I have met with but two instances of fatal termination from direct and immediate effects of spontaneous hemorrhage. Great diversity in relation to the power of sustaining sanguineous discharges occurs in different individuals. In some, immediate and alarming prostration is produced by comparatively small discharges of blood. Others will sustain exceedingly copious evacuations with but little immediate inconvenience, and speedily recover their usual vigor and health. The quantity of blood which may be lost without any dangerous or ill consequences is, indeed, in some instances, surprisingly great. Bertholini relates a case in which sixteen pounds of blood were discharged from the stomach without any serious consequences. In another instance, he says, the quantity of blood lost from the nose, in the course of three days, was still greater.§ Nicholai also mentions extraordinary instances of this kind. (*Pathologie*, b. vi. p. 353.) Hemorrhages depending on chronic visceral disease are, in general, more intractable than such as are free from disorder

much more concerned in the development of these and other predispositions, varying by age, than the circumstances mentioned by Cullen.

* Fr. Cas. Medicus. Geschichte Periodischer Krankheiten. Hanover, 1784.

† Reil, loc. cit., bd. iii. p. 38.

‡ Rev. Médicale, Feb. 1827.

§ Anatom. Quintum Renov., 375. Reil, loc. cit., p. 27.

of this kind. When they occur during the stage of *excitement* of fevers, their effects are usually salutary, and should not be checked unless they become very copious and debilitating. The hemorrhages which take place in the period of collapse always portend the utmost degree of danger; they seem to depend on a general paralysis of the capillary system, indicative of incipient dissolution. Hemorrhages which depend merely on the local congestion or irritation in an organ, without any constitutional disease, are seldom copious, and usually terminate spontaneously as soon as the local plethora is removed. It is different with those sanguineous discharges where the local congestion and determination are sustained by some internal or constitutional irritation. In such cases the hemorrhage is particularly apt to continue long, to recur frequently, and to resist the permanent success of remedial applications. The prognosis depends also, in some degree, on the importance of the organ from which the hemorrhage proceeds. A hemorrhage from the lungs is, *cæteris paribus*, more to be dreaded than one from the stomach; and this latter is more dangerous than a bleeding from the nose.

With regard to the remote consequences of copious losses of blood, it may be observed, that individuals of a relaxed, nervous, phlegmatic, and irritable habit of body, are much more apt to suffer dangerous secondary disorders from such discharges than persons of a contrary physical temperament.

Treatment.—The general indications to be kept in view in the treatment of hemorrhages, are: 1. To lessen the momentum of the circulation, if it be above, or at its natural standard; 2. To diminish the determination of blood to, and moderate the local vascular action in, the part from which the hemorrhage occurs; and 3. To excite a contraction of the vessels of the part. The first indication is to be fulfilled by venesection and the exhibition of sedatives—as nitre, digitalis, cold, &c. The second indication demands counter-irritating and revulsive applications—such as cold, applied, if practicable, to the part from which the blood flows; and blisters, sinapisms, warmth and rubefacient frictions, on remote situations. The last indication requires the internal use of astringents—such as sugar of lead, alum, muriated tincture of iron, &c.; and where the situation of the part will admit of it, the external application of styptics.

Having made these general observations on hemorrhages, I proceed to the consideration of the particular varieties, according to the part from which they proceed.

1. *Epistaxis—Bleeding from the Nose.*

This is by far the most common variety of hemorrhage. As has already been observed, epistaxis occurs most frequently in early life, particularly about the age of puberty. The eruption of the blood is often preceded by symptoms indicative of a congested state of the vessels of the head—as a sense of weight and tension in the temples; violent beating pain in the head; throbbing of the carotids; flushed face; giddiness; ringing in the ears; and a sense of tickling, tension, or stinging pain in the nose. In weak and irritable persons, other symptoms, in addition to these, denoting a nervous and spasmodic condition of the system, are apt to occur—namely, slight creeping chills; disposition to syncope; cold extremities; a constricted state of the skin; and a small, corded, and quick pulse. In general, only a few ounces of blood are discharged, and with this small loss of blood all the foregoing symptoms disappear. Sometimes, however, the blood flows so copiously and continuedly as to become alarming, and to demand active measures for its suppression.* The blood very rarely proceeds from both nostrils.

Causes.—The exciting causes of epistaxis are exceedingly various. What-

* Ploquet has collected a number of instances in which unusually large quantities of blood were discharged from the nose without fatal consequences.—*Bibliotheca Medico-Pract.*, vol. iv. p. 69.

ever has a tendency to produce a preternatural determination of blood to the head, may give rise to this variety of hemorrhage; such as insolation, stimulating ingesta, protracted study, the warm bath, sneezing, coughing, playing on wind instruments, violent parturient efforts, straining in evacuating the bowels, a depending position of the head, violent affections of the mind, strong blushing, *intestinal irritation*, heavy lifting, &c. Chronic visceral disorders, particularly indurations of the *spleen* and liver, strongly predispose to epistaxis, and this hemorrhage appears sometimes to be the consequence of organic affections of the heart and of the large vascular trunks. Suppression of the menstrual and hemorrhoidal evacuations may give rise to this hemorrhage; and it never fails to occur in that attenuated and watery state of the blood which usually follows copious sanguineous and other evacuations, in relaxed and leucophlegmatic habits. Bleeding from the nose is no uncommon occurrence in dropsical patients, and in the latter stage of cachectic diseases, particularly scurvy.

Prognosis.—Epistaxis is seldom of much consequence when it is not symptomatic of some serious visceral or general affection. When, however, it occurs readily and frequently in early life, it would seem to indicate a particular predisposition to hæmoptysis and phthisis pulmonalis; and frequent or habitual epistaxis, in middle and advanced age, may be regarded as a pretty sure indication of the existence of organic visceral disease, and of a strong tendency to dropsy or apoplexy, according to the general physical temperament and structure of the individual. Hemorrhages from the nose, in inflammatory fevers, and in the stage of excitement of every form of fever, typhus as well as malignant, are to be regarded as salutary; but when they occur in the sinking stage, or period of collapse, they manifest a highly dangerous condition. This, as indeed all other varieties of hemorrhage, is most apt to become troublesome and dangerous in debilitated, relaxed, and irritable subjects; more especially when the blood, at the same time, is thin and watery, or dissolved, as in scurvy. The most unmanageable hemorrhages from the nose are those which depend on some abdominal irritation or obstruction, in connection with an attenuated state of the blood. Epistaxis is, however, very rarely fatal from the immediate effects of mere loss of blood, although, like other varieties of sanguineous discharges, it may lead to a train of distressing and dangerous chronic affections.

Treatment.—In being called to a case of epistaxis for remedial aid, the first and most important question is:—Are the circumstances preceding and accompanying the hemorrhage, and is the hemorrhage itself of such a character as to render it most proper to arrest it, or to suffer it to go on until it ceases spontaneously? When the hemorrhage occurs in consequence of suppressed menstrual or hemorrhoidal discharge, it ought not to be interfered with, unless it becomes excessive; and the same observation applies to the occurrence of this evacuation in the stage of excitement of febrile affections. In general, whenever epistaxis is attended with an active pulse, and symptoms of cephalic congestion, no attempt should be made to arrest the bleeding by local applications; but, on the contrary, nature should be assisted in the reduction of the vascular excitement by venesection, rest with the head in an elevated position, cold drinks, laxatives, and *nitre*. The last article, given in *large* doses, is often particularly beneficial, in cases of considerable arterial excitement. I have used it in every variety of active hemorrhage, with prompt and complete success, without any auxiliary application. This mode of proceeding is especially necessary in persons of robust and plethoric habits, and in such as are subject to hemorrhoidal discharges. But when nasal hemorrhage occurs in weak, nervous, and cachectic individuals, and particularly when the manifestations of general vascular turgescence and increased momentum of the circulation are absent, the sooner it is arrested the better.*

* [In severe nasal hemorrhage I generally succeed by nauseating doses of tartar emetic, and the action of a blister on the nape. In extreme cases, it is best to plug the nostrils in the posterior orifice, by a plug of lint or sponge brought forward from the throat, by Bellocque's canula, and in part by a common plug that will fill the anterior nostril.—Mc.]

In moderate cases, it will often be sufficient to apply cold water to the temples, head and nape of the neck, when the head is kept in an elevated position. Richter asserts, that cold water applied to the genital organs, has a sudden and powerful effect in arresting bleeding from the nose. If the hemorrhage should not yield to these simple measures, small doses of sugar of lead may be given internally. This is decidedly the best internal astringent in every variety of active hemorrhage.* From one to two grains may be given every half hour until the bleeding is checked; and, in most cases, its effects are promptly successful. The *gallic acid*, also, is said to be a very powerful styptic for the cure of this and other varieties of internal hemorrhage. Dr. A. T. Thompson has lately published the result of his analysis of Ruspini's celebrated styptic, and from this it would appear, that its active principle is the *gallic acid*. Ruspini's styptic is, according to Dr. Johnson's experience, "unquestionably the most powerful restrainer of hemorrhage which we possess;" and as its price is "enormous," it is much to be hoped that Dr. Thompson's analysis may be correct. Be this as it may, experience has shown that the gallic acid is a powerful agent for restraining internal hemorrhages. In general, the hemorrhage may soon be permanently arrested by these means; but where the hemorrhagic disposition is strong, or in relaxed and debilitated habits, the bleeding, though checked for a time by applications of this kind, is apt to return again and again, until the system becomes greatly exhausted. In cases of this kind, we may generally succeed in putting a permanent stop to the discharge, by applying a blister to the back of the neck; and in order to obtain vesication speedily, the skin, where the blister is to be applied, should be previously well rubbed with the terebinthinate decoction of cantharides, oil of monarda punctata, or some other active rubefacient.

Warm pediluvium is always a useful auxiliary remedy, by determining the circulation to the inferior parts of the body; or, instead of this, sinapisms may be applied to the ankles or soles of the feet. Local styptics are recommended in obstinate cases, but they are very rarely of much avail, and may even do mischief by the irritation they cause in the Schneiderian membrane, and the consequent afflux of blood. Nevertheless, in obstinate and alarming cases, a dossil of lint, dipped in some astringent solution, should be introduced into the nostril, and passed up to the part from which the blood issues. In general, however, simple compression, by plugging up the nostril with lint, will answer all the purposes that can be obtained from applications of this kind. The patient must be cautioned against blowing his nose, as well as against everything which may excite the arterial system. Upon the whole, bleeding, purgatives and nitre, with cold water to the head, warm pediluvium, or sinapisms to the feet, blisters to the back of the neck, the internal use of the sugar of lead, and finally, mechanical compression, are the remedies which must be relied on in this variety of hemorrhage.

2. *Hæmatemesis—Hemorrhage from the Stomach.*

The premonitory symptoms of hemorrhage from the stomach are, in general, conspicuous. They consist in a sense of weight and pressure in the epigastrium; loss of appetite, or voraciousness; foul breath; acid eructations; pain and tenderness in the hypochondria; nausea; anxiety; ringing in the ears; disposition to syncope; a small, contracted and irritated pulse; alternate flushes of heat and chills; palpitation; cold extremities; a pale and contracted countenance; and, finally, extreme anxiety, and weakness and constriction about the breast; the

* Various other internal astringents have been recommended—as, the sulphate of zinc, alum, sulphate of copper, gum kino, and the muriated tincture of iron. They are, however, greatly inferior to the sugar of lead.

senses become confused; great sickness of the stomach, with a feeling of approaching syncope; and, at last, copious ejections of blood from the stomach ensue. The blood thrown up is generally of a very dark color, sometimes in coagulated clots, and at others quite fluid. Occasionally, however, it is florid and liquid. Instances are mentioned, in which small masses of concreted lymph, deprived of the cruor, resembling pseudo-membranous structures, were thrown up.* Sometimes the blood ejected is of a black color, resembling tar. In cases of this kind, the hemorrhage probably proceeds from the liver. In malignant fevers, particularly in yellow fever, the discharge resembles coffee-grounds suspended in a glairy fluid. This would seem to be generally the case when the hemorrhage arises from inflammation and abrasion of the mucous membrane of the stomach. In some instances, partial syncope follows the vomiting, and the patient complains of pain in the region of the spleen and in the lower part of the abdomen. The quantity of blood thrown up at once is often very great. Instances of *fatal* hemorrhage in the stomach have occurred, also, in which little or no blood was discharged, (Richter;) and in some cases the blood passes off by the bowels, with little or no discharge by vomiting. After the blood which had gradually accumulated in the stomach is thrown off, the patient generally soon feels greatly relieved, though often much exhausted. Very frequently, however, the same train of symptoms already mentioned return, after a longer or shorter interval, and terminate in another spell of vomiting of blood; and the hæmatemesis may thus recur several times before it finally ceases.

The hemorrhage, no doubt, generally occurs from the mucous membrane of the stomach, but it is thought also to proceed, in some cases, from the liver or spleen. When the blood comes from the former organ, it passes along the common bile duct into the duodenum, and thence regurgitates into the stomach. When the spleen is the source of the hemorrhage, if this be ever the case, the blood, it is supposed, gains admission into the stomach through the *vasa brevia*. Richter observes that the frequent tumefaction of the spleen, a short time before the occurrence of hæmatemesis, as well as the morbid or unnatural condition of this organ in those who die of this disease, renders this opinion very probable. It is more likely, however, that the spleen is no further concerned in the production of this hemorrhage than by the congestion which it is peculiarly calculated to produce in the vessels of the stomach when its own structure becomes engorged or indurated.

The darker and more coagulated the blood is when thrown up, the slower, we may presume, must have been the hemorrhage, or the longer it must have lain in the stomach. A portion of the effused blood always gains admission into the bowels, and hence generally dark, grumous, alvine discharges occur for several days after an attack of hæmatemesis.

Causes.—Everything which tends to impede the free circulation of the blood in the abdominal viscera, may give rise to this variety of hemorrhage. Among the circumstances which tend most particularly to this effect, are indurations of the liver and spleen. It occurs, also, in consequence of suppressed hemorrhoidal discharge, more especially when favored by an indulgence in the pleasures of the table, or by an inactive and sedentary mode of life. In no subjects, however, is vomiting of blood more apt to occur than in young females, soon after the age of puberty, laboring under menstrual irregularities. It appears also occasionally to arise from pregnancy, and from the final cessation of the menses at the critical period of life. Various local causes may produce hæmatemesis, such as acrid or corroding substances received into the stomach; blows on the epigastrium; and it takes place sometimes in the last stage of malignant fevers. The blood may proceed from the nose, and gradually descend into the stomach. This occurs, sometimes, in patients confined to bed by other diseases. In such cases, however, the quantity of blood thrown up is always small, and the vomit-

* Reil, Fieberlehre, b. iii. p. 134.

ing is not preceded by the spasmodic and painful affections of the stomach mentioned above.

Prognosis.—When hæmatemesis occurs in consequence of suppressed hemorrhoidal or catamenial discharge, it is not, in general, attended with much immediate danger, unless the vomiting returns frequently, in which case it seldom fails to lead to a train of distressing and dangerous consequences, such as dropsy, inveterate dyspepsia, hysteria, hypochondriasis, and great languor, relaxation, and debility. It is most dangerous when it arises from visceral obstructions, particularly in persons who are addicted to the intemperate use of spirituous liquors. There is no variety of hemorrhage more apt to become habitual than this one. Tissot relates a case which recurred regularly every month, instead of the menstrual evacuation, without any evil consequences whatever.

Treatment.—The momentum of the circulation must be diminished by venesection when it is above the natural standard. A large sinapism should be immediately applied to the epigastric and hypochondriac regions, in order to derive the blood as much as possible from the vessels of the stomach. Dry cupping may also be beneficially used for this purpose; and warm pediluvium will assist materially in deriving the circulation from the congested abdominal viscera. Laxative enemata should be administered. In that variety of hæmatemesis which attacks females between puberty and the age of thirty, purgatives, according to the experience of Dr. Hamilton, are among our most valuable remedial means. There is generally, in cases of this kind, considerable menstrual irregularity, caused apparently by a loaded and torpid state of the intestinal canal. Free purgation, by exciting the portal circulation, and removing the intestinal irritation, will generally prevent the recurrence of the hemorrhage in cases of this kind. I have in a few cases known decided benefit obtained from the use of active and repeated purgatives in this affection.

Dr. Sheridan has published some cases which go to show that emetics will sometimes do much good in this variety of hemorrhage. He states that his father had used this remedy with great advantage in hæmatemesis, more than fifty years ago. I have not myself employed emetics in this affection; but I understand that Dr. Chapman has resorted to them with much benefit. Ipecacuanha would appear to be the proper emetic. Various astringents have been recommended in this affection. Saccharum saturni; gallic acid; muriated tincture of iron; spirits of turpentine; alum whey; muriate of soda; kino; cold water; and a variety of astringent vegetable infusions, have been employed and praised for their effects. The sugar of lead does not appear to be as efficient in this as in the other varieties of hemorrhage, although without doubt the best astringent we possess in this affection. Indeed, internal astringents can afford but little advantage when the disease depends on obstructions of the liver or spleen, or upon some other chronic impediment to the regular circulation of blood in the portal circle. I have, nevertheless, derived very great advantage from the use of the spirits of turpentine with castor oil, in purgative doses, in several cases of hæmatemesis. In cachectic and debilitated subjects, more especially in chlorotic females, the muriated tincture of iron sometimes affords peculiar advantages. Burserius recommends the use of copious draughts of cold water in this affection. The expressed juice of the common nettle (*urtica dioica*) has been much extolled for its effects in this hemorrhage, and I have known it used with apparent benefit.

The diet should be of the lightest and most unirritating kind, and the drink bland, cool, and acidulated. After an attack of this disease, the diluted sulphuric acid will generally be useful in restoring the tone of the stomach, and checking the tendency to sanguineous effusions.

3. *Hæmaturia.—Hemorrhage from the Urinary Organs.*

It is often difficult to say whether the hemorrhage in bloody urine comes from the bladder, the ureters, or the kidneys. As it is of some importance, in a practical point of view, to form a correct opinion concerning the source of the bleeding, it will be proper to point out the diagnostic circumstances particularly.

When the blood passes off unmixed with urine, or without an effort to evacuate this secretion, the hemorrhage, it may be inferred, proceeds from some part of the urethra, (*stimatosis.*) When the discharge of bloody urine is attended with a stinging or dull pain about the neck of the bladder, and a sense of fullness and uneasiness in the perineum, accompanied with frequent painful erections, and burning pain in the glans penis and anus, and the blood comes off in small flocculi, intermixed with pretty large coagula floating in the urine, there is good reason to infer that the hemorrhage proceeds from the bladder. The coagula sometimes block up the neck of the bladder or urethra so completely as to cause complete suppression of the urine, and render the introduction of the catheter necessary to procure its evacuation.

In hemorrhage from the kidneys or ureters the blood is always very intimately mixed with the urine, so as to give to the discharge a uniform bloody appearance, without flakes, or small coagulæ. After the urine has stood some time, the blood subsides to the bottom of the vessel, into a uniform paste-like substance, leaving the supernatant urine clear. In hemorrhage from the kidneys, the patient in general experiences little or no unpleasant sensations in the bladder; but in the region of the kidneys more or less pain and uneasiness are always felt, and there is usually a retraction of the testicle on one side, with a feeling of numbness on the thigh.

Hæmaturia sometimes occurs periodically. This is most apt to be the case when the hemorrhage proceeds from the neck of the bladder, and is attended with an irregular or ineffectual hemorrhoidal effort in the system. I am now attending a gentleman who has been regularly affected with bleeding from the bladder every two months for the last four years. He was formerly much troubled with hemorrhois, but since the present complaint began, he has had no hemorrhage from the rectum.

This variety of hemorrhage is most apt to occur in old people—more especially in such as have been much affected with hemorrhois, or in such as are of a gouty habit. Richter says that plethoric and corpulent women are peculiarly liable to hæmaturia about the period of the final cessation of the catamenia. It is not uncommon to meet with this affection in very young children during dentition.

Causes.—Hæmaturia is often excited by calculous concretions in the kidneys and bladder, and by acrid or stimulating diuretics, as cantharides, spirit of turpentine, garlic and other similar substances. It arises also from organic affections of the urinary organs. Scirrhus, ulcerations and vascular or fleshy tumours in the bladder, ureters, and kidneys, may produce it. In some instances, the hemorrhage occurs from a varicose state of the mucous membrane of the bladder; and it would seem that a highly congested condition of this membrane from chronic inflammation, is sometimes the cause of this affection. When the predisposition to the disease is strong, it may be readily excited by whatever is capable of increasing the general momentum of the circulation, and particularly by mechanical agitation of the urinary organs. There is a gentleman in this city who has been afflicted with bloody discharges from the bladder, at short intervals, for more than six years. It is frequently brought on immediately by active exercise, and especially by riding in a carriage over a rough pavement. It is not connected with calculus, nor with pain, though often accompanied with a sense of weight, pressure, and uneasiness about the neck of the bladder. One of the most frequent

causes of hæmaturia in advanced age is an ineffectual hemorrhoidal effort, or suppression of this discharge after it has become habitual.

Hemorrhage from the urethra frequently occurs in gonorrhœa, in consequence of irritating injections.

This variety of hemorrhage is seldom attended with alarming effects from the mere loss of blood. When it occurs in the latter stage of violent grades of fever, it is indeed one of the most fatal signs. Frequent and copious hemorrhagic discharges from the bladder in old people are particularly apt to lead to dropsical effusions. (Richter.) When, however, it occurs vicariously in the place of hemorrhois or menstruation, it is rarely followed by serious consequences; nor is this hemorrhage attended with danger when it arises from irritating diuretics, from dentition, or from overheating, unless it be connected with considerable inflammation.

Persons who have once been affected with this complaint, are in general particularly liable to a return of it from the action of any of its exciting causes.

Treatment.—In plethoric and young subjects an attack of hæmaturia, like any other hemorrhage in such a habit, requires a prompt reduction of the momentum of the circulation by venesection. When the hemorrhage depends on calculous irritation in the kidneys, the warm bath, assisted by opium and sugar of lead, is generally decidedly beneficial. A quarter of a grain of opium with a grain of sugar of lead, may be given every hour, until the pain and irritation are allayed. Free venesection should, however, be premised in such cases; and much advantage may also be obtained from cupping and sinapisms over the region of the affected kidney. Along with these measures, copious draughts of mucilaginous diluents should be taken, more especially when the real irritation arises from acrid diuretics, or other substances taken internally. The uva ursi has been much recommended for the cure of this affection; but although I have tried it repeatedly, I have never yet derived any obvious benefit from it. Dr. A. T. Thomson says that "the addition of some gallic acid to a tincture of uva ursi, will be found to answer every indication that can be expected from the employment of astringents in hæmaturia."* When the hemorrhage is not attended with symptoms of renal irritation, or pain in the region of the bladder, the muriated tincture of iron, with the free use of mucilaginous drinks, will often do much good. I have in several instances found this astringent decidedly beneficial, after the sugar of lead had failed to procure any advantages. From twelve to twenty drops of this tincture may be given three, four, or five times daily, according to the urgency of the symptoms. In all instances the diet should be light, unirritating, and digestible, and all kinds of stimulating beverages, and active diuretics, most carefully avoided.† In one case of long standing, I succeeded in putting a permanent termination to the hemorrhage by small doses of alum and ipecacuanha,‡ in conjunction with mild diet, mucilaginous drinks, and the occasional use of a mild aperient. Reil recommends cold and bland injections into the bladder when the blood proceeds from this viscus. He mentions also strong coffee, with laudanum, taken occasionally, as useful when this affection is attended with difficulty and pain in voiding the urine. In habitual hæmaturia, a caustic issue on the upper and inner part of the thigh, or near the groin on the abdomen, is said to have proved very beneficial. (Richter.) In recent cases of an obstinate character, we may sometimes make a successful impression on the disease by sinapisms applied over the sacrum. I have known this application to arrest a copious hemorrhage from the bladder, after various other measures had been adopted without avail. Various astringent vegetable infusions have been employed and recommended in this variety

* Ed. Med. and Phys. Journ., January, 1831.

† Burserius relates an instance of obstinate hæmaturia, which was cured by a long course of milk diet without any other remedies.—*Institutionum Med. Pract.*, vol. iv. p. 487.

‡ ℞.—Pulv. aluminis ℥i.

—— ipecac. grs. xx.—M. Divide into ten equal parts. S. Take one every morning, noon and evening.

of hemorrhage, but they seem to be of little value.* In chronic and moderate cases, we may employ a decoction of logwood with occasional benefit. Where the blood proceeds from the urethra, cold water or ice should be kept applied to the genitals. This will seldom fail to put a stop to the bleeding. We may also inject cold solutions of the sugar of lead in cases of this kind. The patient should not be permitted to use any exercise in recent cases. Perfect rest is often essential, particularly when the hemorrhage is attended with manifest local and general irritation.

4. *Hæmoptysis—Hemorrhage from the Lungs.*

This term is applied to hemorrhages from the respiratory passages, whether they proceed from the larynx, the trachea, or the bronchia. In its concomitant phenomena, degrees of violence, and duration, hæmoptysis varies very much. In many instances the quantity of blood brought up is very small; in some cases it is discharged in considerable but not exhausting quantities; and occasionally the bleeding is sudden and exceedingly copious.

Active hemorrhage from the lungs is often preceded by certain premonitory symptoms; such as a feeling of heaviness and lassitude in the extremities; anxiety; stricture across the breast; short cough; palpitation of the heart; deep and frequent sighing; a deep-seated, pungent or burning pain under the sternum, and slight creeping chills; cold hands and feet; alternate paleness and flushing of the face; mental and corporeal irritability; a quick, small, frequent and corded pulse; and often a disagreeable salty or sweetish taste in the mouth. After these symptoms have continued for a longer or shorter period, the patient usually begins to feel a sense of warmth in the breast, gradually rising up towards the larynx, attended with a saltish taste. Slight coughing now ensues, or an effort is made to hawk, and the blood makes its appearance. In many cases, however, the hemorrhage comes on suddenly, without any premonitory symptoms whatever. When this is the case, there is commonly but little blood discharged at a time: but the hemorrhage is apt to return frequently for several weeks, and even months.

The blood is usually very florid and frothy, particularly when it proceeds from the trachea and larger bronchia. In malignant fevers, scurvy, gangrene of the lungs, and in the pneumonia of old people, the blood, however, is dark, and sometimes almost black, and generally dissolved.

When the hemorrhage proceeds from the fauces, the blood is generally spit out without coughing, and when it comes from the cavity of the mouth, there is usually neither coughing nor hawking in throwing out the blood. In some instances, however, when the bleeding is profuse, the blood descends and irritates the glottis, giving rise to a mixed effort of coughing and vomiting, which may readily lead to the supposition that the blood proceeds from the lungs.

Portal mentions a singular instance, which was treated unsuccessfully for hemorrhage from the lungs. The quantity of blood coughed up was very copious, and although frequently checked, recurred again and again until the patient sunk under it. On dissection, the bronchial glands were found much tumefied—some of them as large as a hazelnut, and charged with a large quantity of black fluid. The lungs were sound, but the bronchial cells were filled with a dark grumous fluid.

In most instances, those who have once suffered an attack of spitting of blood, are subject to returns of it at irregular periods; and in some rare instances this affection has been known to return periodically. Schrœder mentions a case in which a considerable portion of blood was coughed up every morning for many days in succession, not the least hemorrhage having occurred during the rest of the day; and Alexander Thompson relates an instance in which hemorrhage from the lungs came on every third day with perfect regularity for upwards of a year.

* [A decoction of peach leaves has often proved serviceable in my hands.—Mc.]

Reil also saw a case of quotidian hæmoptysis in a female, which continued for two years. The bleeding always occurred in the morning. Cases in which hemorrhage from the lungs returned monthly, are mentioned by Amatus Lusitanus, Schenck, Meyer and Mead; and Richter mentions an instance in which it occurred every four weeks instead of the menstrual evacuation, for upwards of twenty-five years. (*Spec. Thérap.*) Blanchard saw an instance of its recurrence for a long period (every three months) in consequence of suppressed hemorrhoidal discharge.*

Predisposition.—The period of life most favorable to the occurrence of this variety of hemorrhage, is between the fifteenth and thirtieth years of age. Some individuals are constitutionally predisposed to it; and, indeed, in the majority of cases, in which it occurs spontaneously, such a predisposition lies at the bottom of the disease. This predisposition would seem to consist in an irritable state of the circulatory system generally; and in a delicate organization of the pulmonary system. The habit of body—so far as its physical conformation may be concerned—which seems most generally connected with a particular predisposition to this hemorrhage, consists in a narrow, flattened, and depressed chest; high, prominent, square shoulders; a long and slender neck; a general slender and delicate frame of body; fair hair, and blue eyes; a delicate and fair skin, through which the superficial veins are conspicuous; red cheeks; sound white teeth; and a clear but not powerful voice. Such individuals are of a sanguineous temperament; irritable, passionate, full of activity, but incapable of enduring much exertion; they are apt to be troubled with irregular determinations of blood, particularly to the head; and slight exciting causes create a palpitation of the heart and general arterial excitement. During early youth, persons of this temperament and habit are apt to be affected with glandular swellings about the neck; eruptions on the scalp and behind the ears; and as they advance in age, with slight catarrhal affections, which frequently go off slowly with a copious expectoration. In such individuals, after they have passed the age of puberty, the ordinary exciting causes of hemorrhages are particularly apt to give rise to spitting of blood.

Causes.—The exciting causes of hæmoptysis are, of course, extremely various. The following are among the most common and powerful. Atmospheric vicissitudes; violent bodily exertions; the intemperate use of stimulating drinks; the suppression of habitual evacuations; the sudden drying up of old ulcers; repercussion of cutaneous eruptions; suppressed habitual sweating of the feet; metastasis of gout; rheumatism; irritating substances acting directly on the mucous membrane of the lungs, as the inhalation of fine irritating particles floating in the air, or of gaseous substances; intestinal irritation; organic diseases of the heart; obstruction of the spleen or liver; a sudden diminution of atmospheric pressure; breathing a very heated air; blows on the chest; costiveness; loud speaking, or singing; violent mental excitement; and organic affections of the lungs, impeding the free circulation of the blood through its vessels, particularly tubercles. Hæmoptysis sometimes follows the amputation of a limb or the taking up of a large artery.

Prognosis.—Hæmoptysis seldom proves fatal from the mere loss of blood. It is, nevertheless, generally of very serious import—being, in many instances, the forerunner or attendant of phthisis pulmonalis. It is not, however, always followed by consumption, or even connected with a phthisical habit.† Instances of pulmonary hemorrhage not unfrequently occur without any dangerous consequences whatever; and this is more apt to be the case when the discharge comes on suddenly and profusely, than when there is an expectoration merely streaked

* Medicus. Geschichte Periodischer Krankheiten, th. i. p. 115.

† [Louis thinks it the invariable precursor of phthisis. In this, however, he is certainly mistaken. I have had many patients live for years after repeated attacks of hæmoptysis, without exhibiting any signs of tubercles.—Mc]

with blood. The prognosis as to the remote consequences, depends, however, much on the presence or absence of the general manifestations of a scrofulous or phthisical habit mentioned above. Where these indications are unequivocal, the occurrence of hemorrhage from the respiratory passages is always to be regarded as highly dangerous. When this hemorrhage occurs from pregnancy or suppressed catamenial or hemorrhoidal discharge, there is usually no reason to apprehend any very serious consequences, if a predisposition to consumption does not exist. In general, hæmoptysis, resulting from causes which suddenly produce strong pulmonary congestion, or general arterial excitement—such as lifting heavy weights, or other violent bodily exertions; loud singing or declaiming; playing on wind instruments; over-distension of the stomach; stimulating drinks, &c.—is much less apt to lead to dangerous consequences than cases that occur spontaneously.

Treatment.—The remedial management of hæmoptysis divides itself into that which is proper during the actual existence of the hemorrhage, and that which should be pursued after the bleeding is arrested.

When the pulse is frequent, tense or hard, the momentum of the circulation should be immediately reduced by venesection; and to effect this purpose adequately, it is often necessary to abstract blood very copiously. In some instances, the pulse will be found very small, but tense and firm to the touch; and in such cases it is particularly important to resort to prompt and very free venesection. At the same time that this step is taken, large portions of *common salt*,* or small doses of sugar of lead, should be administered at short intervals, until the hemorrhage is checked. A large sinapism should also be applied over the breast, as soon as the activity of the pulse is reduced. Perfect rest and cooling drinks should be rigidly enjoined. If the feet are cold, warm applications or sinapisms ought to be applied to them; and the patient may take an occasional draught of *cold water*.† If the bowels are constipated, the rectum should be emptied by laxative enemata. In cases of this kind, large doses of the *nitrate of potash* will often promptly arrest the hemorrhage; and in a manifestly phlogistic state of the system, it is decidedly the best internal remedy we possess in this affection. This article was long ago strongly recommended by Selle;‡ and Richter speaks very favorably of its powers in this disease. Dickson also gave it in very large portions, dissolved in mucilaginous fluid, in this affection, with much benefit;§ and we may likewise cite the experience of Gibbon‖ and Hartman¶ in favor of its excellent effects. In Italy it has of late years been greatly extolled as a remedy in hæmoptysis, and, according to my own experience, not more than it deserves. Récamier has, within a few years, reported some cases illustrative of its beneficial effects in this variety of hemorrhage. He gave half an ounce of nitre dissolved in a mucilaginous mixture, in the course of twenty-four hours, and in this way three cases were promptly relieved after bleeding and other

* This article was first introduced to the notice of the profession, as a prompt and efficient remedy in hæmoptysis, by Dr. Rush. It would seem, however, from Schopf's account of his Travels in the United States (bd. i. p. 116), that the knowledge of its powers in this way was first brought to this country from Ireland, by Schiel.(*a*)

F. Hoffman and Fordyce assert that a solution of *sulphate of soda* will often do more good in hæmoptysis than any other remedy.

† Burserius (Inst. Med. Pract., vol. iv. p. 33) says much in favor of the use of frequent draughts of cold water, (the temperature of which is to be lessened from time to time, until it is at last taken as cold as ice,) in this variety of hemorrhage.

‡ Medicini Clinica. Berlin, 1797, p. 147.

§ Lond. Med. Obser., vol. vi., No. xvi.

‖ Medical Cases and Remarks, Lond., 1800.

¶ Nova Act. R. Soc. Scient., Upsal., vol. i. p. 109, as quoted in Richter's Ausfuhrliche Arzneimittellehre, vol. iv. p. 242.

(*a*) [Notwithstanding such high authority, I am confident that the practice is bad. Salt water increases the irritation although it tends to check the hemorrhage. It leaves the parts dry and constricted. Tartar emetic, in nauseating doses, has always acted promptly under my observation, overcoming all the irritation at the same time that it is followed by a moist expectoration which subverts the inflammation.—Mc.]

remedies had been used ineffectually.* From fifteen to twenty grains of this article, dissolved in a small cup of barley water, or some other mucilaginous fluid, may be taken every half hour or hour, until the bleeding is checked. A great variety of internal astringent remedies have been recommended in this affection —such as alum, colcothar of vitriol, sulphate of copper, sulphuric acid, &c.; but they are all much inferior in efficacy to the sugar of lead. This article may be given in doses of from one to five grains every half hour or hour, or at longer intervals, according to the rapidity of the hemorrhage. It appears to be equally applicable in cases attended with an active or debilitated state of the circulation. I have generally given it in union with calomel, where the diathesis was phlogistic; but in cases attended with a nervous or spasmodic condition, opium is the best adjuvant.

In cases attended with an irritated, small, frequent pulse, with a pale and contracted countenance, cold extremities and a dry skin, small doses of sugar of lead, in combination with opium and calomel,† will generally procure prompt relief. Richter and Meza‡ recommend ipecacuanha in such cases. The former writer states that he has often promptly arrested hæmoptysis, attended with cold extremities, alternate flushing and paleness of the face, limpid urine, small and hard pulse, and much anxiety in the chest, by exhibiting a quarter of a grain of ipecacuanha every fifteen minutes. (*Specielle Thérapie.*) It is in instances of this kind that *emetics* may be given with advantage. Whenever a congestive state of the pulmonary system is present in this affection, with deficient action of the cutaneous capillaries, vomits will be likely to prove serviceable. They were formerly much, and too indiscriminately, recommended by some practitioners. (*Brian Robinson.*) In ordinary cases, attended with a plethoric and excited state of the system, they are unquestionably hazardous. In the spasmodic and nervous cases just mentioned, Harles,§ Stork, Richter, Plater, and others, speak very favorably of *hyoscyamus*. Harles particularly recommends an oil prepared by boiling the leaves of this plant in flaxseed oil; and F. Hoffman considers the extract, given in doses of from one to three grains every hour, as one of our best remedies in such cases. According to Dr. Miner's experience, the powdered capsicum, given in doses of from three to five grains every ten minutes, is a most efficient remedy in hæmoptysis. I have had occasion to prescribe this article in one instance lately, and the result has given me a very favorable impression of its powers in this respect.

When spitting of blood assumes a chronic character, and is attended with an irritated state of the pulse, digitalis sometimes does much good. From one-fourth to half a grain of the powdered leaves, or from fifteen to twenty drops of the tincture, may be taken every four hours, until a manifest impression is made on the pulse. It will be proper to keep the system moderately under its influence for ten or twelve days. In cases of this kind, much advantage will, in general, result from blistering the breast—or, what is still better, *pustulating* this part with tartar emetic ointment, or establishing a more permanent discharge by a caustic issue or seton.

The nature of the occasional cause should be particularly kept in view in regulating the treatment of hemorrhage, and especially for the prevention of its recurrence.

When hæmoptysis supervenes in consequence of suppressed hemorrhoidal discharge, advantage may be obtained from the use of small doses of aloes, and particularly from the application of leeches to the anus. These measures are

* Med.-Chir. Rev., January 1826.

† R.—Calomel grs. vi.
Pulv. acetat. plumbi grs. xii.
—— opii grs. iii.—M. Divide into twelve equal parts. Give one every thirty minutes if the hemorrhage is considerable, or every two hours in less rapid cases.

‡ Reil, Fieberlehre, bd iii. p. 107.

§ Hufeland's Journal der Pract. Heilkund, b. ix. s. ii. p. 47.

particularly useful in conjunction with a light diet, moderate exercise, and an occasional general bleeding, to obviate the return of the hemorrhage from the lungs.

When the disease appears to arise from general plethora, in consequence of a free indulgence in the pleasures of the table, and an indolent course of life, or sedentary habit, it will be necessary to enjoin a simple, unirritating, and moderate diet, cooling drinks, moderate exercise, and the avoidance of all kinds of stimulating beverages.

Should the hæmoptysis be dependent on irregular, gouty irritation, or rheumatism, especial advantage may be gained from setons or issues on the inferior extremities, and a course of treatment calculated to counteract these affections.

When abdominal indurations exist, or intestinal irritation from a loaded state of the bowels, or acrid secretions, a gentle course of mercurial and aperient remedies, the extract of taraxacum, and other deobstruents, with a regulated diet and exercise, will be most likely to ensure exemption from a subsequent attack of the hemorrhage.

If the bleeding appears to be excited by a violent cough, attended with irritation of the respiratory passages, expectorants, demulcents, leeching and cupping on the chest, venesection, and opiates, are particularly indicated. In such cases frequent doses of flaxseed oil are said to be very beneficial.* When the cough is violent and spasmodic, and the pulse contracted and small, with a dry skin, small doses of camphor and ipecacuanha, with mucilaginous drinks, often procure great and speedy relief. (Richter, *Specielle Thérapie*, bd. iii. p. 297.)

When hæmoptysis occurs in young females from menstrual irregularities, we may resort to the tincture of cantharides, venesection, blisters to the sacrum, riding on horseback, and the warm hip-bath; but the ordinary stimulating emmenagogues must be carefully avoided. When cases of this kind are attended with a chlorotic, or sluggish and relaxed state of the system, the ferruginous preparations, the tincture of cinnamon, exercise by gestation, a nourishing and digestible diet, with aloetic aperients, &c., may be properly used. I have employed the following pills with obvious benefit in two instances of this kind.†

5. *Menorrhagia—Hemorrhage from the Uterus.*

Uterine hemorrhage appears under a great variety of modifications, both in relation to its phenomena and causes. Under the present head, however, I shall treat only of those hemorrhagic discharges which occur in the unimpregnated state of the uterus—excluding, also, such as depend on organic or structural disease of the womb.

In some instances, the menstrual secretion becomes so copious as to cause much debility and exhaustion, and to require remedial interference. In many females, the flow of menses is always very large, who nevertheless enjoy a state of vigorous health. In instances of this kind, the discharge must not be regared as morbid or immoderate, however copious it may be; for if the system sustains no inconvenience from it, it is to be viewed as natural or consistent with the constitutional habit of the individual in whom it occurs. So long, therefore, as the health of the female continues unmolested by copious menstruation, it cannot be accounted immoderate, or a proper object of medical attention; but when this evacuation gives rise to debility, exhaustion, and other symptoms of ill health, it amounts to a morbid discharge, and requires remedial measures.

Immoderate flow of the menses must not be confounded with *menorrhagia*. This latter is, strictly speaking, a *hemorrhage*, whilst the former consists in a

* Journal de Méd., tom. xxx. p. 85.

† ℞.—Prussiat. ferri ʒi.
G. aloes soc. grs. viii.
Tart. antimon. grs. ii.
Conserv. rosar. q. s.—M. Divide into thirty pills. S. Take two every morning, noon and evening.

mere superabundant *secretion* of the natural or healthy menstrual evacuation. In menorrhagia the effused blood retains its power of coagulation, or at least shows a tendency to coagulate; but in immoderate menstrual discharge, it remains liquid and entirely free from coagula.

Menorrhagia is sometimes preceded by various premonitory symptoms; such as pain and tension in the loins and pubic region; a feeling of fullness and pressing down in the uterus; frequent desire to pass urine; a small, contracted, and frequent—or full, wave-like, or rebounding pulse; heaviness of the head, ringing and noise in the ears; slight and creeping chills, transient flushes, and sense of weight in the feet. In many instances, however, the hemorrhage commences without any indications of its approach. Sometimes a sudden gush of blood takes place, which continues to flow very copiously for a few hours and then ceases. More commonly, however, the discharge continues for four or five days, and in some instances several weeks, and goes off very gradually. When it occurs about the period of the final cessation of the menses, it is apt to become very protracted in its duration, more especially in females of plethoric and relaxed habits of body.

All the consequences that have already been mentioned as apt to occur from the excessive loss of blood, are especially prone to supervene from uterine hemorrhage. Women of a nervous temperament are liable to sudden amaurosis from excessive uterine hemorrhage, and they are especially subject to a very peculiar nervous pain in the head over the region of the orbit of one side; and sometimes they become affected with a distressing jarring noise "like that of a mill or threshing floor." (Hall.) When menorrhagia is copious, and prolonged in its course, or recurs frequently at short intervals, it seldom fails to produce great relaxation and debility, and to lead ultimately to a train of very distressing, and even dangerous affections. Females who are much affected with this hemorrhage become pale, sallow, weak, and dyspeptic; and in phlegmatic habits, œdema of the feet, or general anasarcous effusion, pains in the stomach, with great muscular prostration, are apt to ensue. Leucorrhœa, often extremely copious, almost universally occurs during the intervals of the hemorrhages, and contributes greatly to the general debility and relaxation.

Menorrhagia may with much propriety be divided into *active* and *passive*.* The former variety occurs in sanguineous, robust, florid, and healthy females, and is almost invariably preceded for a short time by the natural menstrual secretion. These cases rarely continue more than seven or eight days, and are often attended with considerable pain in the lower part of the abdomen, with a frequent and tense pulse, and a dry and feverish state of the skin. *Passive* menorrhagia is almost entirely confined to the period when the uterus is about losing its functions—and is met with only in such as have been much debilitated and relaxed by privations or previous diseases, particularly protracted and profuse leucorrhœa; or in individuals of a nervous or phlegmatic temperament, who

* Dr. Dewees thinks there is good reason to doubt the propriety of this "mechanical distinction." He adopts the doctrine of Broussais, that all hemorrhages are *active*, and quotes Dr. Caldwell in support of this opinion. Strictly speaking, there is, perhaps, no hemorrhage absolutely *passive*, and in which the vessels that furnish the blood do not co-operate in the production of the hemorrhage by some kind of action. In a practical point of view, however, this distinction is unquestionably both proper and useful. Would Dr. Dewees not consider *aloes* a very improper remedy in the menorrhagia of young, sanguineous, and robust females? He no doubt would. And why? Because experience has shown that this article is among our most efficient means for exciting the uterine vessels, and directing the afflux of blood to them. Yet this article, given in small, but frequent doses, deserves to be accounted the best remedy we possess for those protracted, exhausting, and obstinate uterine hemorrhages which occur in relaxed, nervous, and phlegmatic habits, about the critical period of life. When, therefore, we see a particular modification of this discharge arrested by a remedy which we are accustomed to regard as decidedly calculated to stimulate the vessels from which it occurs—in other words, when we cure the hemorrhage by exciting applications, we have good grounds for distinguishing it from those cases of the same affection which are invariably *increased* by its operation.

have been subject to profuse catamenial or menorrhagic discharges. The pulse, in cases of this kind, is small and weak; the muscular system relaxed and debilitated; the skin cool and pale; the countenance exsanguious, and expressive of anxiety and languor; the urine generally pale; and the stomach disturbed with frequent nausea and other unpleasant sensations. The discharge is apt to continue for three or four weeks, and sometimes much longer. When in bed, the hemorrhage is usually moderate; but on rising, or making the least bodily exertion, the flow of blood is often suddenly increased. If the hemorrhage ceases, it is succeeded by a profuse leucorrhœal discharge, which is quite thin or watery.

Causes.—Females of vigorous and sanguineous habits are more subject to menorrhagia than the feeble. The predisposition to this hemorrhage is much favored by whatever has a tendency to produce general plethora, and by an irritable and relaxed state of the system. A luxurious and indolent life; the free use of high-seasoned and nourishing diet, wines, and cordials; tightly laced corsets; frequent and long indulgence in the warm bath; habitual costiveness, and inordinate sexual indulgence, are among the most common and influential predisposing causes of active menorrhagia. Copious and protracted leucorrhœa; mental depression; deficient and unwholesome nourishment; habitual exposure to a cold or humid atmosphere; in short everything that is capable of relaxing and debilitating the general as well as the uterine system, may favor the occurrence of passive menorrhagia.

Whatever tends to produce sanguineous congestion in the uterus may excite this hemorrhage; such as riding on horseback; dancing; active purgation; the use of emmenagogues; immoderate venereal indulgence; long and rapid walking; a fall on the hips; stimulating diet and drinks; a loaded and constipated state of the bowels; suppressed hemorrhoidal discharge; induration of the liver or spleen; and reading voluptuous novels, &c.

Treatment.—The indications in this, as in the other varieties of hemorrhage, are, to remove the predisposing and exciting causes, if practicable; to lessen the momentum of the general circulation, if it be not below the natural standard; to derive the circulation from the uterine system; and finally, to constringe the bleeding vessels.

If the pulse be active, or tense and quick, venesection will be proper; and everything which has a tendency to excite the action of the heart and arteries must be removed. The patient should lie on a matress, avoid getting up or walking about, and take only the lightest kinds of liquid farinaceous nourishment and cooling acidulated drinks. Having diminished the momentum of the circulation, recourse must next be had to such remedies as experience has shown to be capable of constringing, or in some way or other checking the hemorrhagic action of the bleeding vessels. Among these, the *sugar of lead* holds the first rank, and will seldom disappoint our expectations entirely, in the active variety of the disease. From two to three grains, either alone or with a grain of ipecacuanha, may be given every half-hour or hour, or at longer intervals, according to the rapidity of the hemorrhage. When the pulse is contracted and quick, it should be given in union with moderate doses of opium or Dover's powder. I have been in the habit of giving it in such cases with about a grain of camphor and the same quantity of ipecacuanha in each dose, with the view of exciting a gentle diaphoresis.

The tincture of cinnamon is, perhaps, more frequently used by the German physicians in menorrhagia than any other remedy; and my own experience enables me to speak with much confidence of its usefulness in cases unattended with considerable arterial excitement. From thirty to sixty drops of it may be given every hour or two. I have, in some instances, known the discharge very promptly moderated by this medicine alone. A great variety of other astringent remedies are recommended in the books, for the treatment of this hemorrhage. Alum, the extract of rhatany, kino, the sulphate of copper, &c., may, no doubt,

be used with occasional advantage; but they are not equal to the sugar of lead for arresting sudden and rapid menorrhagic discharges. In cases attended with a moderate and protracted flow of blood, the extract of rhatany will often afford much advantage; and in instances of this kind, I have also used alum, in union with ipecacuanha, with marked benefit.* *Tannin* has lately been administered in uterine hemorrhage or menorrhagia, with marked success. M. Chevalier prescribed this article in doses of two grains every two hours, in a case of uterine hemorrhage, after a great variety of other remedies had been used with little or no advantage. "On the first day, some amendment was perceptible; on the second, the discharge was but very slight; and on the third day, hemorrhage was completely arrested, giving place to an abundant leucorrhœa; but this also disappeared under the continued use of the tannin. M. Chevalier employed this remedy in several other obstinate cases of menorrhagia, and always with the happiest effect."† In cases accompanied with increased arterial excitement, the *nitrate of potash*, given in large doses, will often afford prompt relief. When the hemorrhage is profuse and rapid, cold applications to the vulva and region of the pubis should be made. We may also resort to cold and astringent injections into the vagina. When the violence of the discharge has been in some degree checked, and it continues in a moderate degree, *elixir of vitriol*, diluted in cold water, may be taken at short intervals with advantage. Should the measures already indicated fail to arrest or sufficiently to moderate the hemorrhage, recourse must be had to the *tampon*. A strip of soft linen should be introduced by pushing it gradually into the vagina on the point of the finger, until the exit of the blood is obstructed. This will cause the formation of a coagulum, which, being immediately in contact with the bleeding surface, prevents the further progress of the effusion. *Emetics* also have been recommended for the suppression of uterine hemorrhage; and in active cases of a protracted character, attended with symptoms of gastric disorder, an emetic dose of ipecacuanha will occasionally do much good.‡ Perfect rest, a light simple diet, and cooling drinks, must be enjoined, and all mental agitation carefully avoided.

In passive and protracted hemorrhage from the womb, attended with the symptoms mentioned above as indicative of this variety of menorrhagia, little or no permanent advantage can be obtained from astringent and cooling remedies. These hemorrhages are, indeed, often extremely obstinate in their course. From much attention to cases of this kind, I am satisfied that the appropriate remedies are such as tend to invigorate the uterine vessels. Blisters to the sacrum will, in some instances, do much good; but the remedy which has most frequently succeeded in my hands, is a combination of aloes and the prussiate of iron,§ in conjunction with the tincture of cinnamon. With these medicines I have often succeeded promptly in arresting such hemorrhages. Dr. Dewees recommends small doses of *hiera picra*, a combination which I have known very effectual in several cases. Aloes is an old remedy in this variety of hemorrhage. Burdach, in his Materia Medica, mentions its usefulness in such cases. Ergot may also be used with a prospect of advantage; and I have even resorted to the more active emmenagogues, such as the extract of *savin*, with evident benefit; and in no instance with disadvantage. The savin has, indeed, been highly recommended by several German writers, in uterine hemorrhages of this kind. Dr. Feist asserts, that in menorrhagia of long continuance, attended with a sluggish and relaxed habit of body, and a pale and fetid

* ℞.—Pulv. sulph. aluminis ℈i.
Pulv. ipecac. grs. xii.—M. Divide into six equal parts. Give one every three or four hours.

† Revue Médicale, September 1828.

‡ Eberle's Mat. Med., vol. i. p. 27. Second edition.

§ ℞.—Prussiate ferri ʒi.
G. aloes grs. v.
Conserv. rosar. q. s.—M. Divide into twenty pills. Take one three times daily.

discharge, prompt and complete relief may, in general, be obtained from the use of savin.* He recommends the following formula for administering this article:

℞.—Pulv. folior. sabin. ʒiii.
Extract. sabin. ʒii.
Ol. sabin. ℈i. Divide into three grain pills. Take four three times daily.

Dr. Gunther, of Cologne, also, has published an account of some cases of profuse and long-continued menorrhagia which yielded to the extract of savin given in scruple doses.† The prussiate of iron, in doses of from ten to fifteen grains, has been employed by some practitioners with much success; and I do not doubt, from what I have seen of its powers, that it may be very beneficially given in this form of passive hemorrhage. We may also resort to the muriated tincture of iron in cases of this kind. I have lately succeeded in putting a stop to a protracted hemorrhage of this kind, by a mixture of the compound tincture of aloes and the muriated tincture of iron, according to the following prescription:

℞.—Tinct. aloes compos.
—— ferri. muriat., āā ʒss.—M. Take twenty drops four times daily.

CHAPTER XX.

PHLEGMASIÆ OF THE LYMPHATIC SYSTEM.

Phlegmasia Dolens.

This singular phlegmasial affection is almost exclusively confined to females in the *puerperal state;* and is characterized by a pale, tense, elastic, and extremely tender swelling of one of the inferior extremities; communicating to the touch a feeling of numerous indurated nodules and ridges under the skin; and attended with more or less fever, usually of a hectic character.

As has just been stated, phlegmasia dolens is almost exclusively a puerperal affection; and it appears from general observation, that the most common period of its attack varies between the fifth and ninth days after parturition. It is asserted by some writers, (Good,) that this disease has "never been known to affect any other part of the body than the lower extremities;" but Carus and some other authors mention instances of its occurrence in the superior extremities.

In general, the first manifestations of the disease are: pain and stiffness in the groin of one side, preceded or accompanied with chills or strong rigors, followed speedily by the ordinary train of pyrexial symptoms. Occasionally, though rarely, the disease commences by pain and swelling in the foot, an instance of which I saw about fifteen years ago. Wherever the starting point of the disease may be, the swelling more or less rapidly extends itself over the whole limb, and continues to increase until the extremity becomes enormously distended and exquisitely painful to the touch. To the sight the swelling exhibits an even and uniform surface; but when the hand is lightly pressed over it, a number of hard ridges and little indurations are felt apparently immediately under the skin. The skin presents a pale or white, smooth, and glabrous appearance, and is preternaturally warm to the touch. In general, the swelling extends to the labium pudendi of the affected side, leaving the opposite labium and contiguous parts entirely free from tumefaction and pain. More or less tenderness is generally felt in the iliac region of the affected side, and the track of the round ligament is

* Gemeinsame Deutsche Zeitschrift für geburtskunde.
† Rev. Méd, Jan. 1827.

especially apt to become painful or tender. Mr. Trye, indeed, considers the tenderness in the course of the round ligament as a pathognomonic symptom. Position produces no change in the swelling, as is the case in œdema. When the disease is at its height, the skin of the affected limb is much whiter than that of the sound side; and its temperature is always very considerably augmented. The disease is always attended, from its commencement, with considerable irritative fever, and the patient is generally extremely restless, and tormented by her sufferings.

The duration of the disease is very variable. It seldom, however, terminates under two weeks; and it may be prolonged to the fifth week, and even to a longer period. When it is about declining slight sweats break out over the whole surface of the body, and the urine deposits a reddish sediment whilst the fever progressively abates. The declension of the swelling is always very gradual, and the leg very rarely returns to the size of the sound one. Some degree of stiffness of the muscles of the leg usually remains after the total subsidence of the disease; and the skin continues for many months to be less movable on the subjacent parts than in the sound state.

In some instances, though very rarely, the inflammation terminates in suppuration; and when this happens, the cellular membrane sloughs out from between the skin and muscles, as in the suppuration of erysipelas. The occurrence of this accident is always attended with the utmost danger. The only two fatal cases I have ever seen terminated in this way—a termination which, in both instances, was caused by the ruinous treatment of an empiric, under whose mismanagement the cases were placed.

In general the breast becomes flaccid, and the secretion of milk is in part, or even wholly suspended. It is singular that this fact should be denied by Dr. Good; for I can affirm, that I have never met with an instance of this malady, in which the lacteous secretion was not conspicuously diminished. Dr. Huston, of this city, in a well-written and interesting paper on this disease,* declares that "in all the cases he has seen, the secretion of milk was diminished, and in some wholly suspended during the violence of the disease;" and the same observation is made by nearly every writer on this subject I have consulted.

In relation to the etiology and nature of this affection, writers have expressed a great variety of opinions. By many the disease has been ascribed to a metastatic transference of the lacteous secretion from the breasts to the affected limb, giving rise to the deposition of milk into the cellular tissue of the extremity. This opinion was advocated by Puzos, Levret, Astruc, Doublet, Mauriceau, and by nearly all the German writers on this subject until a very recent date. Others have ascribed the disease to an obstruction of the lymphatics at the brim of the pelvis, by the pressure of the child's head during parturition, giving rise to overdistension and consequent *rupture* of the lymphatics, whence effusion and accumulation of lymph in the glands and cellular tissue of the limb ensue. This doctrine was advanced by Mr. White, of Manchester; but its fallacy has been abundantly exposed by various writers. Denman and others maintain that phlegmasia dolens consists essentially in *lymphatic inflammation*, commencing in one or more lymphatic glands in the groin, and thence extending along the lymphatic branches, until the whole limb becomes affected. The primary inflammation of the inguinal glands is excited, he thinks, by the acrid matter which is absorbed from the vagina. Dr. Hull conceived the disease to consist of inflammation of the muscles, cellular tissue, and inferior surface of the cutis, giving rise to a sudden effusion of serum and coagulable lymph into the cellular texture of the extremity; and according to Dr. Hosack, the inflammation occurs in *all* the structures of the limb—in the blood-vessels, absorbents, muscles, cellular membrane, skin, &c. In relation to this latter opinion, Dr. Huston very justly observes that it is difficult "to conceive of an inflammation of all the blood-vessels of a

* North American Medical and Surgical Journal, vols. iv. and v.

limb, without the appearance of redness; or of such extensive inflammation as that involving every tissue of a part, without its termination in suppuration, gangrene, or other bad consequences, far more frequently than happens in phlegmasia dolens." More recently, Dr. Davies, of London, has published some observations, tending to show that phlegmasia dolens is the result of an inflammation of one or more large veins "terminating in the formation of artificial membranes and other obstructions within their cavities, whereby the free return of the blood from the extremity is prevented." This doctrine is also sanctioned by M. Velpeau; but the phenomena of phlebitis are certainly very different from those which characterize phlegmasia dolens; and there does not, on comparing these affections, appear to exist any reasonable grounds for this opinion. (Dewees, Huston.)

Whatever we may think of the mode of origin, or the location of the morbid condition which constitutes this affection, there can be no doubt that it is essentially an inflammatory affection; and there exists the highest degree of probability, that the whole system of lymphatic vessels of the limb is engorged and greatly distended with lymph, at the same time that some effusion may occur into the subcutaneous and intermuscular texture. The following sentiments, expressed by Dr. Huston, are entirely accordant with my own views on this subject, and as they embrace a clear summary of the arguments on this point, I cannot do better than to adopt his language.

"I believe it to consist in a complete '*engorgement*' of the whole lymphatic system of the affected limb; produced by an inflamed condition of the different conglobate glands, through which the chief lymphatic vessels have to pass, on their way from the affected part to the thoracic duct.

"This inflammation may occur either primarily in one or more glands, or first in a principal lymphatic trunk, and thence extend to the glands. And this may originate either, 1st, from the gland or lymphatic trunk being bruised by the passage of the child's head through the pelvis during labor: or 2d, from exposure to cold, and especially a damp or humid atmosphere; or the putting on of ill-dried clothes, during the irritable condition of the female system which attends the puerperal state: or 3d, from the absorption of some acrimonious matter, whereby the internal surface of the lymphatics themselves may be excited to inflammation, and thence extended to their appropriate glands; or the matter may be transmitted to the glands, and there excite inflammation. My reasons for the opinions which have been advanced, are briefly as follows:

"1st. The fact of every woman's exposure to one of the preceding exciting causes, and frequently to all of them.

"2d. The uniform occurrence of pain or uneasiness about the passage of the round ligament, in the groin, and down the inside of the thigh, *preceding* the existence of swelling or other affection of the limb whatsoever: showing conclusively the priority of disease in the glands and their communicating trunks.

"3d. The white color of the affected limb; which can only be accounted for satisfactorily, by supposing an '*engorgement*' of the vessels which carry white fluids; for were it congestion of the blood-vessels, as in ordinary inflammation, there would necessarily be redness, instead of the white aspect.

"4th. The state of the woman's system generally, as the pulse, tongue, hectic form of fever, &c., all of which manifest a state or condition totally different from what is observed in cases of high and unequivocal inflammatory action; evidencing a state of *irritation*, or inflammatory action of a low or subacute character. This state of irritation may be readily accounted for, by the great distension of the lymphatic vessels of the limb, throughout their utmost ramifications, and the consequent pressure which must thence be made upon the immensity of nervous fibrils by which they are surrounded.

"Lastly. Its termination; which is far more uniform, and less fatal, than an equal extent of inflammation, attended with congestion of the blood-vessels seated in any part of the body; proving incontestably, that it must have a course pecu-

liar to itself; which course, very commonly commencing by a diminution of pain in the iliac and inguinal regions, and next of the swelling of the parts nearest those glands, indicates very clearly the seat of the disease to be in the lymphatic system, and especially the conglobate glands."

This doctrine does not differ materially from the views given of the pathology of this affection by Trye, Capuron, Gardien, and Denman.

The following appearances were noticed on post-mortem examination of a woman who died of this disease soon after parturition. No remarkable morbid appearance in the uterus, excepting a very turgid state of the spermatic veins, which were very large and tortuous; "the vena cava was healthy, down as far as its juncture with the renal vein, below which it was thickened, and filled with a fibrous substance, varying in consistence, and adhering to the inner coat of the vessel. On laying bare the femoral vein, the subcutaneous cellular tissue was found to be infiltrated with serum, the granules of fat much firmer and more distinct than natural, and the intervening cellular membrane thickened and opaque. The lymphatic glands in the groin were large, full of serum, and closely matted together by a condensed cellular membrane. It was extremely difficult to detach the iliac, femoral, and saphena veins, in consequence of their strong adhesions to their sheath, and the surrounding organized lymph by which they were imbedded." These, together with the popliteal vein, were similar in condition to the inferior cava, except that the substance they contained was thinner, of a brown color, and somewhat purulent appearance. In the remainder of the saphena, and in the veins near the foot, there was a plug of coagulum; they were otherwise healthy. The iliac and femoral arteries contained a small quantity of blood; the other arteries were empty.*

Treatment.—From what has been said concerning the general character of this disease, it is obvious that the treatment must be decidedly antiphlogistic. Blood-letting, both general and local, is required during the early stages of the complaint. The momentum of the circulation should be at once adequately diminished, by an efficient abstraction of blood with the lancet; after which it will be especially useful to apply leeches to the affected limb, particularly about the groin, and along the track of the principal trunks of the lymphatics. Dr. Dewees advises that the leeches should be dispersed over the limb, "that their bites may not be too near each other, as they sometimes leave troublesome sores." This precaution is very proper; as I have myself known very obstinate and extensive ulceration to proceed from a number of leech-bites near the groin, in a case of this kind. In some instances the febrile reaction, though not apparently very vehement, yields with great difficulty; and many venesections are required before the pulse can be sufficiently reduced. Dr. Dewees has found it necessary to bleed six or seven times before the disease yielded; and in a case which I treated about six years ago, five copious bleedings were required before an adequate impression was made on the pulse.

Purgatives should be freely used during the active stage of the disease. Dr. Dewees prefers the following mixture for this purpose.† In one instance I used the *magnesia* in union with the tincture of *colchicum*, with peculiar benefit. The patient was ordered to take a drachm of magnesia, with thirty drops of the tincture, every two hours. After the third dose, free purging ensued; and the result both in diminishing the general phlogistic habit, and mitigating the local symptoms, was much more conspicuous than I had ever before witnessed from purgatives, or from any other remedy in this affection. I have not since had an opportunity of repeating this practice. In general the purgatives should be of the saline kind.

* Lond. Med. and Surg. Journ, April 20, 1833.

† ℞ —Sulph. magnes.

Magnesiæ alb. ust., āā ʒiii.—M. Div. in. chart. iii. One of these to be taken every two hours, until they operate freely.

Diaphoretics, more especially *antimony*, may be employed with considerable advantage in the early periods of the disease. *Tart. emetic*, given in as large doses as the stomach will bear, without causing vomiting, is highly recommended by some writers, and I do not doubt its utility, during the active stage of the complaint. The following mixture forms an excellent diaphoretic, where, after decisive blood-letting, there is much general irritation.*

Some writers have recommended emetics; but unless there are especial indications present for their employment, it does not appear that they are capable of procuring any material advantages.

In debilitated and irritable subjects, and *after proper depletory measures*, in the more robust and phlogistic, opium is often highly serviceable to allay the excessive pain and general irritation which usually attend this affection. This narcotic may be very properly given in union with nitre and ipecacuanha, or, what is still better, in the form of Dover's powders, in combination with nitre. It must be particularly observed, however, that opium is in general decidedly objectionable, so long as the general and local inflammatory symptoms remain considerable; but in the decline of the disease, its effects are almost always highly soothing and beneficial.

Among the external local remedies employed in this affection, besides the leeching already mentioned, fomentations with flannel, wrung out of hot vinegar and water; the application of a strong solution of muriate of ammonia in equal parts of vinegar and water; and, after the pain, heat and swelling begin to abate, moderately stimulating lotions—such as camphorated mixture diluted with an equal portion of brandy or whisky, &c., may be accounted the most beneficial. Some writers strongly recommend the early application of blisters to the groin and to different parts of the extremity; whilst other writers, and amongst these Dr. Dewees, condemn this practice as rarely beneficial, and often decidedly injurious. My own experience does not enable me to say anything in favor of blistering in this complaint, although I have never known any manifest harm to result from it. Where the pain in the extremity is very great, much relief may sometimes be obtained by bathing the limb with laudanum, more especially after proper evacuations have been procured. Emollient poultices have also been recommended for the purpose of allaying the pain, as well as assisting in the dispersion of the swelling; but in the early periods of the disease, this application appears to me calculated to do much mischief. The two cases already mentioned as having terminated in extensive suppuration, and ultimately in death, were treated from the commencement with *poultices;* but as all depletory measures were neglected, much of the mischief, no doubt, depended on the want of proper antiphlogistic means. After the fever, heat and pain have, in a great degree, subsided, emollient applications in the form of a poultice may contribute, in some degree, to the removal of the stiffness and tension of the affected limb; but this purpose is much more effectually answered by frictions with dry flannel; the application of a muslin roller, previously saturated with a strong solution of salt, and dried, to the whole limb; and fumigations of the extremity with the fumes of burning rosin.

During the febrile stage of the disease, the diet must be of the simplest and weakest kind. During convalescence, the aliment should be digestible and nourishing, and when the patient is left in a very debilitated state, gentle tonics may be administered. If the weather is favorable, and the patient sufficiently recovered, exercise by gestation will be highly beneficial.

* ℞.—Pulv. ipecac. compos. grs. xxiv.
Calomel grs. iii.
Pulv. nitrat. potass. ʒi.—M. Divide into eight equal parts. S. Take one every two hours.

CHRONIC DISEASES.

CHAPTER I.

OF CHRONIC NERVOUS DISEASES.

General Observations.

The nervous system gives to organized matter all the peculiar functions of animal life, and, in its higher states of development, renders it a fit recipient for the powers of reason and moral feeling. In a state of health, or freedom from irritation, it qualifies man for the enjoyment and communication of happiness; when disordered it may render him the most deplorable and abject of created beings. Exalted mental endowments, equanimity, and benevolence, may be converted into imbecility, waywardness, and misanthropy; meek piety into the wildness and intolerance of fanaticism; confidence into universal mistrust; and friendship into hatred, by morbid conditions of this component of the human organization.

The chronic diseases of the nervous system may be divided into two classes, viz: 1. Those in which the sensorial or muscular functions are morbidly affected, either separately or conjointly; 2. Those in which the intellectual and moral powers are disordered.

The first of these classes comprehends a great variety of affections, characterized either by a *perversion*, or a *morbid activity*, or *abolition* of one or more of the *sensorial functions;* or by spasm, or convulsion, or paralysis, of a greater or less portion of the *muscular system*.

The examples of singularly *perverted* sensorial functions are numerous. Reil mentions a case in which the whole surface of the body was insensible to heat or cold, and incapable by the touch of distinguishing hardness from softness in bodies. Dufour gives an account of a similar case.* Sauvages relates the case of an individual who always heard two voices, one an octave higher than the other, when any one spoke to him. Individuals have lost the power of distinguishing colors; and some have been much harassed by various visual illusions.

Instances of very distressing morbid increase of sensorial power are frequently met with. The sense of hearing has become so exceedingly acute, that the weakest sounds gave rise to pain and uneasiness; and the same has been observed with regard to the other sensorial powers. In some cases, nervous disorder manifests itself by excruciating pain in some part of the body, as in the various forms of neuralgia.

The sensorial functions may be weakened or entirely *destroyed* by affections seated in the nervous system. When such affections are local, one sense alone may be obliterated; but when the disorder implicates the whole of the sensorium commune—the brain—all the sensorial powers will be suspended. This

* Reil, Fieberlehre, bd. iv. p. 64.

general state of nervous oppression or inactivity is attended with manifest respiration and arterial action, and constitutes what is termed *coma;* a condition which must not be confounded with *syncope*, or *asphyxia*. These latter affections are not accompanied by any perceptible respiratory and arterial actions; and although, like coma, the immediate consequence of impeded cerebral function, yet they are manifestly dependent on different conditions of the encephalic circulation. The pathology in relation to this subject, however, will be illustrated hereafter.

When the nervous irritation passes upon the muscular system, it gives rise to irregular, spasmodic, or convulsive actions, either in one, or in several, or in the majority of the muscles of the body. These convulsive or spasmodic muscular contractions are divided by authors into *tonic* and *clonic*. In the former, the contractions are permanent, as in tetanus; in the latter they occur in quick alternation, with relaxation, as in hysteria and epilepsy. There exists, however, no essential difference between these varieties of convulsive muscular action. They indeed often occur at the same time in the same individual, some muscles remaining in a state of firm contraction, whilst others are alternately relaxed and contracted. In general, however, convulsions of the *clonic* form are attended with less danger than those of the rigid or *tonic* spasmodic affections. The former are frequently the result of a mere temporary sympathetic irritation of the brain, from causes of a transitory character, or susceptible of being removed; whilst the latter usually depend on a more intimate affection of the nervous system, from causes over which we have little or no control. Convulsions, or general spasmodic affections of the voluntary muscles must, therefore, be regarded as the external manifestations of certain morbid actions or conditions of the brain and nerves. The brain, or spinal marrow, is the immediate source of the muscular irritation; and the violence, duration, character, and extent of the convulsive affection, depend on the nature of the cause and the constitutional habit of the patient. In some instances, the cerebral affection which gives rise to the convulsive muscular contractions is so great as to produce a temporary suspension of consciousness, and of the sensorial functions. In others, as in tetanus and chorea, the mind and sensorial powers remain unaffected until the disease becomes inveterate.

Spasmodic contractions are often confined to one part, and indeed frequently to a single muscle. Of this kind are, tonic spasm of the muscles of the eyes, producing *strabismus;* or convulsive action of these muscles, giving rise to rolling of the eyes (*hippus*); spasm of the muscles of the lips and face, (*sardrosis, risus sardonicus,*) giving an expression of malignant laughter to the countenance; tonic contraction of the muscles of the jaws (*trismus*); spasmodic affection of the œsophagus; convulsive action of the diaphragm, producing hiccough (*singultus*); tonic spasm of the erector muscles of the penis, giving rise to painful, and sometimes protracted *priapism;* tonic or clonic spasmodic contractions of the abdominal muscles;* and other local spasms or cramps of the voluntary muscles, are among the most common affections.

The *involuntary muscles* also are subject to spasmodic affections; but these appear to depend more frequently on some local irritation than upon a reflected cerebral impression. The whole arterial system is sometimes affected with clonic convulsive action. This is particularly apt to occur from sudden and violent mental agitation; from gastric irritation; and from organic affections of the heart (*angina pectoris, palpitation*). The stomach, the intestinal tube, the common gall duct, the urethra, uterus, &c., are all particularly liable to painful spasm.

The second class of nervous diseases, those in which the cerebral irritation produces mental derangement, presents a variety of modifications, both in rela-

* Whytt mentions the case of a young woman who was affected with constant convulsive action of the abdominal muscles during the day, though free from them at night when in bed.

tion to the degree and the particular character of the hallucination. In some instances, there is a general derangement of all the intellectual faculties, with violent excitement of the passions; occasional exacerbations of raving delirium and agitation (*mania*). In other cases, the insanity is only partial—the patient retaining the regular powers of his understanding on all but a few or a single subject (*monomania*). Sometimes the reasoning powers become defective or imbecile, and the memory weak or obliterated (*dementia*), a state of mind which is most frequently met with in very old people, and in such as have suffered frequently from convulsive affections, as epilepsy, chorea, or apoplexy. In some instances, almost every trace of intellectual power is wanting, either from a congenital defect in the cerebral organization, or from diseases or accidental causes affecting the brain. These varieties of mental disorder sometimes pass into each other, and present an almost infinite diversity in their particular phenomena. They may arise from causes acting directly on the brain, and from impressions conveyed sympathetically to this organ from remote visceral affections. Whatever be the nature of the remote cause, however, insanity of every variety is always the immediate consequence of some peculiar dynamic or organic disorder of the sensorium commune. Under the particular head of these affections, I shall enter more fully into the etiological consideration of this subject.

Sect. I.—*Apoplexy.*

Apoplexy may be defined, a sudden loss or suspension of the animal functions, with a slow and full pulse, laborious breathing, generally attended with stertor; whilst the organic or vital functions continue with little or no perceptible disturbance.

In some instances, the apoplectic attack comes on suddenly without any precursory indications of its approach. Occasionally, indeed, patients feel unusually well for some time previous to an attack of this affection, and this is most apt to be the case in individuals of a gouty habit. (Richter.) Much more frequently, however, various premonitory symptoms, indicative of cerebral disturbance, precede the attack; and amongst these the following are the most common: vertigo; a dull and deep-seated pain, or sense of weight in the head, particularly on stooping, or suddenly turning the head round; a turgid state of the veins of the head; throbbing of the temporal arteries; ringing in the ears; inability to articulate distinctly; dimness of sight; transient obtuseness of hearing; sparks and flashes of light before the eyes; bleeding of the nose; drowsiness; confusion of ideas, manifested by incoherent talking; disturbed and heavy sleep; loss or unusual weakness of the memory; general sluggishness, both of body and mind; irregular spasmodic contraction of the muscles of the face; and, occasionally, transient pains in the pit of the stomach, and nausea. In some instances, a numbness is felt in the fingers or in one side of the body shortly before the attack supervenes. In general, the symptoms which announce the approach of an apoplectic attack, indicate an unusual determination of blood to the head. Of these symptoms, however, vertigo, ringing in the ears, dimness of sight, and pain and heaviness in the head, are by far the most common precursors of an attack of this disease.

The duration of these symptoms is extremely various. In some cases, they do not continue more than a few hours before the attack ensues; in others, they occur with occasional remissions or intermissions, for several weeks or months, and even years. Occasionally, the most alarming of the foregoing symptoms occur and continue for a longer or shorter time, without terminating in an attack of this disease. The premonitory symptoms often become considerably aggravated immediately before the apoplectic attack supervenes. The fullness, weight, and pain in the head, become suddenly very severe; a sense of tension and

drawing is felt in the muscles of the back of the neck; and, in some instances, pain in the epigastrium, with nausea, occurs just before the attack.

In some cases the apoplectic attack comes on by a *sudden* deprivation of all sensorial power and motion; the patient sinking almost instantaneously into a state of profound stupor, resembling deep and heavy sleep, from which it is impossible to rouse him in the slightest degree. This mode of seizure constitutes what others term *perfect* or *strong apoplexy*, (*apoplexia perfecta, apilepsis, sideratio;*) and generally terminates fatally in a very few hours, and sometimes in less than an hour.

In other cases, the patient is seized with sudden deep-seated pain in the head; tremor of the extremities; confusion of ideas; nausea or vomiting; and vertigo. He then becomes insensible, and sinks down as from syncope; in a short time, however, he recovers sufficiently to converse, and, perhaps, to walk about, but still complains of pain and other unpleasant sensations in the head, with confusion of the mind and giddiness. In the course of a few hours after this temporary recovery, the brain becomes gradually more and more oppressed, until complete insensibility is induced, and the patient lies in a state of deep coma.

Sometimes paralysis of one side suddenly occurs, with loss of speech; pain in some part of the head; slowness and confusion of the mind; and vertigo;—the sensorial functions and consciousness remaining. By degrees, however, the brain becomes more oppressed, and the sensorial powers gradually decline, until profound apoplectic stupor ensues.*

In whatever way the apoplectic attack comes on, the following phenomena attend its course, and serve to distinguish it from the other forms of soporose affections. Immediately after the accession of the fit, the pulse and respiration are weak and often scarcely perceptible.† Both, however, soon recover from the first shock; the pulse becomes full, slow, regular, and often hard; and the respiration slow, oppressed, interrupted or irregular, and *generally* stertorous. Some writers contend that in true apoplexy, *stertorous* breathing is invariably present; but this is not confirmed by general experience.‡ In violent instances, expiration is attended with a puffing motion of the lips, and a frothy saliva is blown out with a sputtering noise. The face is sometimes livid and of a turgid appearance; more frequently, however, it is pale and somewhat bloated. In some instances, the eyes are blood-shot; in others, they are dull, glassy, and fixed, or rolling about in their sockets. In general, the pupils are considerably dilated; and in some cases they are permanently contracted. Dr. Cook states that he has seen instances in which the pupils were almost entirely closed.

The extremities are usually below the natural standard of temperature, but the skin about the body, and particularly of the head, is warm. The jaws are generally spasmodically closed; sometimes they remain widely open. The power of swallowing is occasionally, in very violent cases, entirely destroyed; but in

* Abercrombie. Edin. Med. and Surg. Journ., vol. xiv. p. 554.

† [There is considerable diversity in the character of different cases of apoplexy, not only in the mode of attack, but also in the progress of the disease. I have seen the face pale, the skin cold, and the pulse very small, weak and tremulous for a long period after the attack. In many the face is flushed and tumid, the vessels of the temples and scalp prodigiously distended, and the pulse laboring from the start. The first class of cases would afford good reason to any observer to conclude that something besides, indeed, I might say different from, compression is required to produce the symptoms. A difficult or obstructed action of the vessels requiring of them a *nisus* to carry on the circulation through the brain, would appear to be the proximate cause of the symptoms of apoplexy. Severe pressure may certainly be caused by depressed portions of the skull, or by large internal effusions of blood, without producing this condition of the circulation, and of course without being followed by apoplexy. On the other hand, the same symptoms may have existed before death, and not a source of any kind of compression be discoverable in the most careful post-mortem examination.—Mc.]

‡ I have seen a case of fatal apoplexy, in which the breathing was throughout free from stertor. On post-mortem examination, a coagulum of extravasated blood was found in the centre of the right anterior lobe of the brain, and blood was also effused into the lateral ventricle of that side.

most instances, though greatly impeded, it remains to a degree sufficient to enable the patient to swallow small portions of fluids. In all instances, very considerable torpor of the bowels exists; and this is sometimes so great as to resist every effort to evacuate them by cathartic remedies. Clammy sweats usually break out about the head and neck, and the same sometimes occur on the extremities. In moderate cases, the temperature of the skin, and appearance of the countenance, do not differ from their natural condition; and in such cases, the power of deglutition is generally sufficiently strong to permit the easy administration of medicines by the mouth. This is most apt to be the case in what is termed *apoplexia hydrocephalica*, or the apoplectic stage of hydrocephalus. Towards the termination of fatal cases, the pulse becomes small, irregular and frequent; and the respiration slow, short, and interrupted by long intervals.

If the disease does not end in death, it may terminate:—

1. In the perfect restoration of all the suspended functions, and the enjoyment of good health. This favorable issue may be expected when the various organs gradually resume their respective functions, more especially if consciousness and a command over the voluntary muscles gradually return. The tongue is often the first organ that obeys the commands of volition; after this the upper extremities, then the inferior ones, resume their power of motion; the muscles of the face being in general the last to return to their regular action. Not unfrequently, during the progress of recovery from an attack of apoplexy, general and pretty free perspiration, or diarrhœa, and, in some instances, active vomiting occur. Sometimes sanguineous evacuations attend the favorable termination of the disease; such as epistaxis or hemorrhoidal and menstrual discharges.*

2. In *paralysis of certain parts* of the body, with a restoration of health in all other respects. More or less paralysis, indeed, remains after the majority of apopletic attacks. In some instances the palsied muscles soon resume their natural power; in others, they slowly recover a certain degree of power, without, however, ever regaining their natural state of activity; whilst in some cases little or no perceptible diminution of the paralytic affection ensues—the affected muscles remaining permanently palsied. In most cases in which permanent paralysis is left by an attack of apoplexy, the mind becomes very perceptibly weakened. The power of comprehending complex ideas and the memory are often almost entirely obliterated in persons who recover from a severe apoplectic seizure. Paralysis from apoplexy is usually of the hemiplegic variety; but in some instances, the palsy is confined to a single member or to certain muscles, more especially to such as derive their nerves immediately from the brain, as those of the face.†

3. The apoplectic fit may terminate in a general febrile condition after the sensorial oppression has passed off. In some instances, strong *synochal* fever is developed in proportion as the nervous functions are restored; in others, fever of a *typhoid* character, with manifest gastric irritation, ensues. Several years ago, I was called to a gentleman who a few minutes before had been seized with a fit of strong apoplexy. Under the usual treatment he gradually recovered so as to be able at the end of the fourth day to sit up and converse without difficulty. On the next day strong febrile reaction, with a hot and dry skin, supervened, and notwithstanding the most vigorous antiphlogistic measures, violent delirium ensued, and continued for several days before it subsided. The patient eventually recovered.

Diagnosis.—The diagnosis of apoplexy is not, in general, attended with difficulty. Where a loss of consciousness of the sensorial functions and voluntary motion suddenly comes on, and continues with an active state of the pulse and

* Richter's Specielle Thérapie, bd. viii. p. 711.

† [The so-called *cerebral nerves* do not arise from the brain, but are all referable to the medulla oblongata. Even the olfactories are traceable to the fibres which ascend from the posterior fasciculi of the cord and cerebellum.—Mc.]

full respiration, the case must be regarded as apoplexy. From *syncope* and *asphyxia*, this form of soporose disease is distinguished by the absence or almost imperceptible action of the pulse and respiration in the two former affections. It is sometimes difficult, however, to distinguish apoplexy from deep intoxication. The habits of the individual, the smell of his breath, and the general relaxation of all the muscles, particularly those of the jaws and the sphincters, will generally lead to a correct diagnosis on this point. Dr. Cook observes, that as "the treatment for true apoplexy would not be improper for intoxication, a mistake respecting the cause would not be hurtful to the patient." This is no doubt correct in reference to mistaking intoxication for apoplexy; but if a case of apoplexy were mistaken for intoxication, the consequence might be very injurious to the patient; for under this mistake the case would probably not be subjected to any efficient medical treatment whatever.

Prognosis.—Apoplexy is always to be regarded as a highly dangerous affection. When the sensorial functions are completely abolished, and the respiration is strongly stertorous, intermitting, and attended with a sputtering discharge of saliva from the lips, distortion of the mouth, immobility of the pupils, and an entire loss of the power of swallowing, no reasonable hope can be entertained of a recovery.* Nevertheless, patients do sometimes, though indeed extremely seldom, recover from this affection, after the most profound coma, stertorous respiration, and foaming of the mouth have supervened.* In general, however, if an appropriate and energetic treatment do not soon make a favorable impression upon the disease in its violent form, the case may be regarded as hopeless.†

The duration of the apoplectic attack varies from a few minutes to two or three days. In some instances, death almost immediately follows the apoplectic seizure. This, indeed, has been doubted by some. Dr. Cook thinks that the cases of sudden death which have been ascribed to apoplexy, depended, probably, on some affection of the heart or large vascular trunks within the chest. There is good reason for believing that this has sometimes been the case; but it is by no means improbable, that sudden and extensive extravasations of blood into the substance of the brain, particularly in that part of this organ which gives rise to the respiratory nerves, may suddenly abolish, not only the sensorial powers and voluntary motion, but also the action of respiration, and thus produce speedy death.‡ Death from this affection, however, seldom takes place before the second or third hour from the attack. In most instances, indeed, from twenty to thirty hours, and in some cases five or six days pass, before the fatal termination occurs.

Besides the unfavorable symptoms mentioned above, there are various others which are said to indicate especial danger. When the attack commences with sudden severe pain in the head,§ or with vomiting,‖ or a general spasmodic rigidity of the muscles, the utmost degree of danger is to be apprehended. General, clammy and profuse perspiration, with a small and frequent pulse, is also a peculiarly unfavorable sign. Hippocrates says that the supervention of fever in apoplexy is favorable; but Richter observes that this observation can only be regarded as generally correct when the fever is of the synochal grade, and commences early, for when it supervenes at a late period, and assumes a typhoid character, it never fails to increase the danger. (Loc. cit., 774.)

The prognosis is also influenced by the character of the exciting cause, and

* Portal, Observations sur la Nature et le Traitement de l'Apoplexie, p. 404.

† Cook on Nervous Diseases, p. 113. Boston edition.

‡ A case is related by Dr. Abercrombie, in which death from apoplexy occurred in the space of five minutes. The patient had long complained of headache. While sitting in a crowded meeting, apparently in good health, she suddenly fell down in a state of insensibility, and expired in a few minutes after. On dissection, a thin but extensive layer of extravasated blood was found on the surface of the brain; and small coagula were found also in the substance of the anterior right lobe.

§ Cheyne.

‖ Richter, Specielle Thérapie, bd viii. p. 773.

still more by the presence or absence of that corporeal habit, which experience has shown to predispose especially to this affection.

When there are evident manifestations of some degree of sensibility remaining, such as contraction of the pupils from the stimulus of light; some power of swallowing, &c., together with free and regular respiration, without stertor or discharge of saliva from the lips; a warm and general perspiration; the occurrence of sanguineous discharges, particularly from the nose or hemorrhoidal vessels; diarrhœa, or a copious flow of urine, reasonable hopes may be entertained of a favorable issue of the case.

It was formerly supposed that apoplexy from the rupture of a vessel, and extravasation of blood into the substance of the brain, is always necessarily fatal. This opinion has, however, been satisfactorily controverted by the experience of many of the ablest pathologists of the present day.* The observations and dissections of Riobé, Rochoux,† Cruveilhier, Bricheteau, and Serres,‡ and we may add, of Baillie and Sir Astley Cooper,§ place the occasional recovery from strong apoplexy beyond all doubt. From the numerous dissections made in the Parisian hospitals by the French pathologists just mentioned, we learn, that when sanguineous extravasation into the substance of the brain does not soon terminate in death, a membranous vascular structure is formed around the coagulum, and that the coagulum is afterwards absorbed by the vessels of this membrane or cyst. In the progress of time, this cyst itself becomes absorbed, and leaves a yellowish cicatrix, or laminated, cellular structure, which in some instances is found to contain a small portion of reddish serum. (Rochoux.)‖

Sir Astley Cooper thinks, that in apoplexy from sanguineous extravasation, "the blood never becomes absorbed, but that the brain gradually acquires the power of bearing its pressure, and that thus the general symptoms which are produced at the first moments of extravasation gradually diminish."¶ That the brain is capable of accommodating itself in some degree to unnatural pressure from extravasation, or other causes, cannot be doubted. I knew an instance of considerable depression of a small portion of the superior and lateral part of the os frontis from a fall. The child remained in a state of apoplectic insensibility for about twelve hours, and very gradually recovered a state of perfect consciousness in about three days. The depression still continues, and, with the exception of occasional headache, no inconvenience appears to remain from the accident. The numerous and well-attested facts that have been brought to light by the authorities already mentioned, are nevertheless sufficient testimony to establish the truth of the occasional absorption of sanguineous effusions in the brain. Bricheteau and Riobé have reported numerous dissections, "all proving, not only the resorption of the effused fluid, but a reunion of the lacerated surfaces afterwards by a kind of cicatrization."**

Causes.—A variety of circumstances, both in relation to the constitutional habits of individuals, and extraneous influences, appear to predispose to this affection. Of these predisposing causes, the following are the principal:—

1. *A peculiar conformation of the body;* consisting in a large head; thick short neck; broad shoulders; ample chest; florid, and full face; short stature; globular abdomen, with a tendency to plethora and obesity. Such individuals are

* Recherches sur l'Apoplexie.

† Considerations et Observations sur l'Apoplexie.

‡ Nouvelle Division des Apoplexies. Annuaire Medico-Chirurg., vol. i.

§ Cook, loc. cit., p. 129.

‖ "After the absorption of the extravasated coagulum," says Rochoux, "the sides of the cavities approximate, and unite into a kind of cicatrix by the intervention of a cellular and vascular structure, forming various areolæ, between which a reddish serous fluid is found. These parietes are much more dense than the rest of the brain, about a line or two in thickness, and of a yellowish-brown color. He asserts that these caverns are invariably found after apoplexy terminating in paralysis, and that their number constantly corresponds with the number of previous attacks."

¶ Cook on Nervous Diseases, p. 129.

** Med.-Chir. Rev., June 1820.

often subject to hemorrhage from the nose, as well as to sensations of weight and fullness in the head, particularly on stooping, or making strong corporeal exertions. When they sleep with the head lying low, they are restless, disturbed with dreams, and the respiration is heavy and sonorous. Such a corporeal structure constitutes, no doubt, in many instances, the hereditary predisposition to this disease, noticed occasionally in particular families.* It is to be presumed also that a peculiar condition of the intimate organization may, in some cases, establish a constitutional tendency to inordinate determinations to the head, and to the consequent occurrence of apoplexy and other cerebral affections.

2. *Age.*—The observation of Hippocrates, that apoplexy occurs chiefly between the fortieth and sixtieth years of age, (*Aphor.* sect. vi., *Aphor.* 27,) still holds good at the present day. Instances of apoplexy occur, indeed, at a much earlier period of life, particularly between the thirtieth and fortieth years; but in a general estimate it will be found that a very large majority of cases happen after the age of forty. Rochoux states, that out of sixty-three cases of this disease, two occurred between the ages of twenty and thirty—eight between thirty and forty—seven between forty and fifty—ten between fifty and sixty—twenty between sixty and seventy—twenty-three between seventy and eighty—and one between eighty and ninety years of age. It would appear from this statement, that apoplexies occur more frequently *after* the age of sixty than at any previous period; and this corresponds with the sentiments of Cullen and Portal. The greater liability to apoplexy at an advanced period of life, cannot be referred to a mere increased tendency to a preternatural determination of blood to the head; for in infancy this tendency is acknowledged to be generally greater than at any subsequent period of life; and yet apoplexy at this early age is an extremely rare occurrence. Some other circumstances, therefore, connected with advanced age, must be the cause of this greater aptitude to the disease. Many pathologists have ascribed this increased tendency to apoplexy in old people, to an ossified state of the cerebral vessels; but this opinion is not verified by post-mortem examinations. Others, with more plausibility, have supposed that it may depend on a weakened state of these vessels, similar to that morbid condition of the arterial coats which favors the occurrence of aneurism. It is probable, however, that this predisposition depends on various circumstances of a general character connected with old age, independent of a morbid condition of the cerebral vessels.

3. *Whatever tends to produce general plethora*, or to keep up a preternatural determination of blood to the brain, increases the liability to apoplexy. A full and nourishing diet; the habitual use of stimulating drinks, particularly in connection with an inactive and sedentary course of life, are especially calculated to increase the predisposition to this disease. Immoderate venereal indulgences at an advanced age; frequent, and long-continued warm bathing; a sudden change from an active or laborious to a quiet or indolent course of life; intense and protracted study; and the free use of strong coffee, are mentioned among the predisposing causes of this disease.

4. Various organic affections, such as aneurism of the aorta; hypertrophy of the heart; visceral indurations; and tumours about the neck, increase the liability to apoplexy.

The *exciting causes* of apoplexy are very numerous. In general, whatever produces inordinate determinations of blood to the head, or impedes its free return from the brain to the heart, may give rise to this disease.

Over-distension of the stomach by immoderate eating, more especially if the ingesta are stimulating and of difficult digestion, and the digestive powers weak, is one of the most common and powerful exciting causes of apoplexy. The intemperate use of spirituous liquors, violent exertions in lifting, much straining in

* Dreysig (Handwörterbuch der Med. Klinik., b. i. p. 450) mentions some remarkable cases of this kind. Portal and Van Hoven also state that they have known families in which a hereditary predisposition to this disease was manifested.

evacuating the feces, strong fits of coughing, sneezing, and great exertions in declaiming, playing on wind instruments, singing, laughing, or speaking, by causing sudden and strong determinations of blood to the head, may produce this disease in individuals predisposed to it. Exposure to the direct rays of the sun in warm climates gives rise to that sudden and fatal affection called *stroke of the sun*, and which is generally regarded as apoplexy. Extreme cold also is capable of producing this affection, by diminishing the circulation in the external vessels, and causing strong internal congestions. Violent and sudden mental excitement, rage, excessive joy, terror, and deep sorrow, have been known to produce this disease. The suppression of habitual discharges, whether sanguineous or serous, may give rise to apoplexy. This is particularly the case with habitual hemorrhoidal discharge or epistaxis in plethoric subjects. The healing up of old ulcers has a tendency also to produce this disease in persons otherwise predisposed to it, (*Schmucker's Vermisch. Schriften.* b. iii. p. 149;) and the neglect of customary venesection in full habits may tend to the same effect.*—Stoll mentions the sudden disappearance of œdema of the feet as an exciting cause of apoplexy. (*Ratio. Medend.*, Pars. iii. p. 305.) Women in the puerperal state "are in some degree liable to apoplexy." Dr. Davis, of London, states that he has met with four or five apoplectic seizures and consequent hemiplegia, in puerperal women. In all these cases, the *habitus apoplecticus* mentioned above was present.† Tumors or visceral indurations in the abdomen, by pressing on the aorta, may give rise to this disease. Morgagni relates an instance which was produced apparently by an enlarged spleen pressing on the aorta.

Apoplexy may also occur in consequence of the repulsion of chronic cutaneous diseases; and it is frequently the result of metastasis of gout. Authors mention also translations of rheumatism, erysipelas, and of other exanthematous affections, among the exciting causes of this disease. I knew an instance in which it appeared to be brought on by a very severe attack of mumps. Violent rigors or chills, particularly the severe and protracted chills of intermittents, sometimes give rise to apoplexy. I have known several fatal instances of this kind. In one case, I stood by the patient when he was seized with the chills; in about ten minutes after they commenced he became insensible; fell into convulsions, and quickly passed into a profound apoplectic stupor, from which he did not recover. The patient was an old, corpulent, and very plethoric man. Intestinal irritation may also cause so strong a determination of blood to the brain as to give rise to this affection.‡

Besides the foregoing causes, which operate apparently by causing undue determinations to the vessels of the brain, apoplexy may also be produced by causes that impede the free return of the venous blood from the head to the heart. Stooping, or other situations in which the head remains in a depending position; wearing tight cravats, and turning the head around to look back, by which the jugular veins are in some degree compressed; impeded circulation through the lungs; *organic diseases of the heart*;§ tumors on the neck, or in situations where they may press upon the veins which convey the blood from the head, are the principal of these causes.

Authors mention also excessive evacuations among the occasional causes of this disease. Boerhaave states, that he knew an instance of apoplexy apparently produced by an excessive hemorrhage from the nose. The tendency of excessive sanguineous evacuations to produce soporose or cerebral oppression very similar to apoplexy, has already been adverted to under the general head of hemor-

* Vogel. Prælectiones Academ., § 558.

† Dr. Davis. Medico-Chirurg. Rev., April, 1825.

‡ There is, indeed, much reason to believe that gastro-intestinal irritation is a very common exciting cause of apoplexy. Thilenius, (*Medicin.-Chirurg. Bemerkungen*, p. 66.) Also Schroder, (*De Apoplexiæ ex præcordior. vitiis Origine. Analecta in Opusc.*, vol. ii. p. 388,)—as quoted in Jahn's Klinik der Chronischen Krankheiten, bd. i. p. 340.

§ See Medico Chirurg. Rev., January 1820, pp. 343 and 345.

rhages. The work of Marshall Hall, referred to in that place, gives some very interesting observations on this subject. It is certainly a very remarkable circumstance, and not accordant with the present received pathology of apoplexy, that entire insensibility, with stertorous breathing, sometimes results from profuse hemorrhage.* Diabetes sometimes terminates fatally, under symptoms strongly resembling apoplexy; and the same termination has been noticed in excessive diarrhœa and cholera. (Richter.) Peculiar atmospheric constitutions have also been ranked among the exciting causes of apoplexy; and from causes of this kind, this disease has at times prevailed epidemically.† Besides the authorities referred to below, we have also the more recent testimony of Weikard, (*Vermisch. Schriften.*, st. i. p. 292, st. ii. p. 65,) and of Jahn, (*Klinik d. Chronisch. Krankheit.*, b. i. p. 333,) in confirmation of this fact; and Baglivi mentions the epidemic occurrence of this affection. Richter states, that a humid, cold, and variable state of the atmosphere appears to be most favorable to the occurrence of apoplexy. It is improbable, however, that a condition of the atmosphere depends more upon its electrical and barometrical state, than on its relative degrees of humidity and temperature. This atmospheric tendency to produce or favor the production of apoplexy is sometimes limited to a few days of continuance. Thus Thilenius states, that in the course of a few days, nine persons were seized with apoplexy in one district. (*Bemerk.*, b. i. p. 67.—*Richter.*)‡

Various organic affections of the brain and its meninges, and the narcotic poisons, are also enumerated among the exciting causes of this disease. Gregory doubts whether these latter can, with propriety, be considered as exciting causes of apoplexy. As they tend, however, to cause strong congestion in the vessels of the brain, they may, no doubt, excite this affection in persons otherwise predisposed to it, as other causes do that strongly determine the circulation to the head.

Pathology.—What is the immediate cause of the abolition of sensorial power and voluntary motion in apoplexy? Pathologists are far from being unanimous in their answers to this question. Some maintain that pressure on the cerebral mass is always the immediate cause of the characteristic phenomena of this disease; others suppose that they depend not on pressure, but simply upon interrupted circulation in the brain;§ whilst some believe that the encephalic effusions are the consequence of a previous morbid change in the brain, (Rochoux,) upon which the loss of sense and motion depends. Some pathologists confine the term apoplexy strictly to sanguineous extravasation within the brain; others include *serous* effusions among the immediate causes of the disease; and many believe, and correctly, too, that mere vascular turgescence, without effusions of any kind, frequently produces apoplexy.

From a careful examination of much of what has been written on this subject, as well as from my own observations, it appears to me clear that the opinion which assigns the characteristic phenomena of apoplexy to *pressure* of the brain, is the correct doctrine on this point.

Post-mortem examination detects in those who die of apoplexy one or more of the following phenomena:—1, vascular turgescence of the brain; 2, sanguineous extravasation into the substance of the brain; 3, serum effused into the ventricles or upon the surface of the brain; and 4, no cognizable cerebral disorder whatever. Of these four conditions, the first only ought, I think, to be considered as primary or essential; the others being consecutive, and not immediately concerned as a cause in the apoplectic seizure.

* For an interesting example of this kind, see Mr. Brown's case of uterine hemorrhage, reported in the London Medical and Physical Journal, 1827.

† Agathias De Bello Gothico, in Hugo Grotii Histor. Gothorum., p. 568. See also Lepecq. de Clotiere. Anleit. f. Aerzte, Epidem. Krankh. Zubeobacht., p. 412. Fr. Hoffman. Medic. Ration. System., tom. ii. p. 11, s. 11, p. 529—as quoted by Richter, Specielle Thérapie, vol. viii. p. 755

‡ Vide Macullough on Malaria.

§ Abercrombie. Researches on the Pathology of the Brain in Apoplexy.

When blood flows more rapidly into the arteries of the brain than it can be returned by the veins, preternatural distension of the cerebral vessels must be the consequence; and this general vascular turgescence must exert an unusual degree of *pressure* on the cerebral mass.

That such vascular engorgement and consequent pressure on the brain are capable of producing all the peculiar symptoms of apoplexy, admits of no doubt. In some instances of fatal apoplexy, the vessels of the brain are found so much engorged with blood, as to render even the smallest branches very conspicuous, and to give a more or less deep red tint to certain portions of the cerebral mass without any sanguineous or serous effusions.* Richter says that an extremely congested state of the cerebral vessels is sometimes the only morbid condition visible within the head.† Bricheteau also observes, "that we often find a general turgescence of the cerebral vessels, which congestion causes a general pressure on the encephalic mass, sufficient to extinguish the nervous influence, and destroy life."‡ Morgagni has related a case in which he found, on dissection, the whole vascular system of the brain extremely engorged with fluid blood. Dr. James Johnson, in commenting on this case, observes—"that apoplexy is frequently produced by *turgescence* of the vessels alone, was believed in ancient times as well as in modern. It is, indeed, reasonable to suppose, that in the majority of apoplectic recoveries, *congestion* only had taken place in the vessels of the brain. But if congestion gives rise to the most favorable cases, it appears capable of producing the most desperate and instantaneously fatal ones also."§ Dr. Fouquier, also, has reported a case of fatal apoplexy, which was manifestly the result of mere sanguineous engorgement of the brain. "The exterior vessels of the brain, and those of the choroid plexus were much engorged with blood;" and the interior of the cerebral mass, when sliced off, presented a multitude of red points. Neither serous nor sanguineous effusion was present.‖

Strong and sudden sanguineous engorgement of the cerebral vessels is, probably, *always* one of the first morbid conditions in the occurrence of apoplexy—the immediate result of diminished vital resistance in the vessels of the brain, and a preternatural afflux of blood to these vessels. (Johnson.) This vascular turgescence may pass off again under proper remedial measures; or it may terminate speedily in sanguineous extravasation into the brain; or continue, finally, without any effusions, until it terminates the patient's life. What is usually termed *serous apoplexy* is perhaps only one of the terminations of apoplexy from vascular turgescence. A sudden violent determination of blood to the brain, and consequent cerebral compression, may immediately destroy all sense and voluntary motion. If the vessels be not relieved by extravasation or by immediate applications, they may, in the course of some hours, relieve themselves by *serous effusion*, as they do in *hydrocephalus acutus;* and this effusion must then become a secondary but permanent cause of cerebral compression. It is unnecessary here to adduce any arguments in support of this pathology of serous apoplexy. We often meet with striking examples of sudden serous or lymphatic effusions from vascular engorgement. Every one has heard of the affection usually called apoplexy of the lungs. Sudden and often fatal effusions of this kind occur into the substance of the lungs from violent engorgement of its blood-vessels.

It appears highly probable, therefore, that strong *vascular turgescence* of the encephalic mass constitutes the primary pathological condition of apoplexy. This state often terminates almost immediately in sanguineous extravasation, or at later periods in serous effusion; and both these consequences constitute, of course, additional causes of cerebral compression.¶

* Portal. Resultats de l'Ouverture des Corps.
† Specielle Thérapie, bd. viii. p. 718.
‡ Journal Complementaire du Dict. des Scien. Med., p. 296.
§ Medico-Chir. Rev., June 1820, p. 9. ‖ Annuaire Medico-Chirurgicale, vol. i. p. 376.
¶ M. Serres contends that both sanguineous and serous affections are always the effect, and not the cause of apoplexy. He denies that pressure, in any case, is capable of producing either

To this view of the pathology of apoplexy it has been objected, that cases sometimes occur in which the brain on dissection exhibits no traces whatever of vascular congestion, nor any other obvious lesions. Petzold has related instances of this kind, which he ascribes to *inanition of the cerebral vessels*, and in which not the slightest unnatural appearances were discovered on dissection, except an empty and collapsed state of the vessels of the brain.* Such cases are, however, extremely uncommon; and do not, upon proper inquiry, militate against the doctrine advocated above. Upon this point Dr. Johnson observes, "that there is nothing more certain than that the vascular turgescence in the brain may so far subside, in the interval between death and dissection, as to leave no trace of its previous existence. This, in fact," he continues, "we consider to be the natural and true solution of the difficulty respecting the cause of apoplexy in those cases where the scalpel cannot detect deviations from the healthy structure."† There is, however, another objection that has been urged against the doctrine of cerebral compression as the exclusive cause of apoplexy, which, though plausible, possesses no real weight. It is stated, and correctly, that all the external manifestations of strong apoplexy are sometimes the immediate result of excessive hemorrhage. I have already referred to the case reported by Mr. Brown, in which entire insensibility and stertorous breathing were the immediate consequences of excessive uterine hemorrhage, and which were removed by transfusing blood from another person into the patient's veins.‡ Dr. Denman has also related an instance of apoplectic symptoms supervening on very profuse hemorrhage,§ and many more cases of this kind might be collected. In relation to such cases it is to be observed, that great losses of blood are peculiarly favorable to extraordinary determinations to the brain, or, as Marshall Hall expresses it, "to increased action and fullness of the cerebral vessels."‖ The experiments of Kellie, on animals, show that serous effusion within the head is a pretty constant concomitant of consequences of excessive sanguineous depletion; and the experiments of Dr. Seeds go to establish the same fact.¶

The sanguineous extravasations are usually found in the corpus striatum, or in the thalami nervorum opticorum. Out of forty-one dissections, Rochoux met with but five or six instances of extravasation in other parts of the brain: and

this disease or hemiplegia. He thinks that what is usually termed serous apoplexy depends on disease of the meninges; apoplexy with paralysis, he says, is the immediate consequence of an altered state of the cerebral structure, attended generally with sanguineous extravasation as a secondary result. His reasons for denying the agency of pressure in the causation of this affection are derived from the fact that fatal apoplexy sometimes occurs without any effusion or extravasation, or even vascular turgescence appearing on dissection;(*a*) and from some experiments which he made on animals, in which the cranium was opened, and a vessel wounded, and the blood carefully confined within the head by closing up the external opening. Although much blood was thus extravasated and lodged into the great interlobular scissure and upon the surface of the brain, no comatose or paralytic affections ensued. These views, so far as cerebral pressure is concerned in the production of the disease, are, however, directly contradicted by the results of some experiments made in relation to this subject by Portal. This pathologist trepanned the cranium of a dog. By different degrees of pressure made on the brain through the opening with the finger or a piece of wood, he could at pleasure produce convulsions, or coma, and apoplectic stertor; and Sir Astley Cooper obtained the same results from similar experiments made on a dog.(*b*)

* Dissert. de apoplexia ex inanitione vasorum cerebri, Goett, 1785.

† Med.-Chir. Rev, June 1820, p. 8. ‡ Lond. Med. and Physical Journal, 1827.

§ Trans. of a Soc. for the Improv. of Med. and Surg. Knowledge, vol. iii. p. 315.

‖ Medical Essays, p. 68.

¶ M. Seeds, in six experiments performed on animals which he bled to death, found the contents of the cranium and spinal canal so engorged with blood, that it might, at first sight, have been thought that blood-letting would have saved the animals.—*Medico-Chirurg. Journ. and Review*, vol. i.

(*a*) [I have made three *post mortem* examinations after apoplexy, in which there was no extravasation or effusion, but general sanguine engorgement prevailed in all of them.—Mc.]

(*b*) Cook on Nervous Diseases.

the observations of Morgagni give nearly the same result.* Extravasation of blood into the cerebellum is an extremely rare occurrence. According to Rochoux it hardly happens once in fifty cases; and Morgagni reports only one instance of this kind. "Blood is rarely effused, *in the first instance*, into the ventricles. During ten years' observation in the different hospitals, M. Bricheteau saw only two cases of this kind. The fluid is generally extravasated in the neighborhood of the ventricles, and bursts into them by a ragged opening." (*Med. Chir. Rev.*, loc. cit.) Occasionally blood has been found effused on the surface of the brain. Rochoux relates a case of this kind; and Richter states that sometimes the brain, on removing the cranium, appears dark, brown, or blackish, through the membranes, from extravasated blood underneath. (*Loc. cit.*, b. viii. p. 719.) The old division of apoplexy into *sanguineous* and *serous*, possesses no importance in a practical point of view. I have already stated that the effused serum sometimes found within the head on dissection, is very probably not the immediate cause of the apoplectic seizure, but one of the results of the vascular engorgement, upon which the apoplexy depends. There are, nevertheless, some circumstances connected with this distinction, which it may be proper to notice. Thus, it appears, from the observations of M. Serres, that when the apoplectic attack is complicated with hemiplegia, we may infer that there is extravasation of blood into the cerebral substance. When, on the other hand, the disease is accompanied with paralysis, we may presume that the substance of the brain remains uninjured, and that more or less serum, or serosanguineous fluid, is effused by the congested and irritated meninges upon the surface, or into the natural cavities of the brain. The former variety—that is, the complicated or paralytic form of the disease—M. Serres calls the *cerebral apoplexy*, from the cerebral mass itself being the principal seat of the morbid changes. The latter, or uncomplicated variety, he denominates *meningeal apoplexy*, on account of the manifest traces of vascular irritation and congestion, discovered by dissection, in the meninges. It appears from the observations made in the Parisian hospitals, that meningeal or serous apoplexy occurs chiefly before the fifteenth and after the sixtieth year of age; and that females are more liable to this variety of the disease than males.

When blood is extravasated into one hemisphere of the brain, the consequent paralysis occurs almost universally on the opposite side of the body. The paralysis is occasionally general—both sides of the body being equally affected. In such cases the mouth is not drawn to either side, and the patient dies as from asphyxia: or as animals do which have the pneumogastric nerves of both sides divided. The extravasation, in cases of this violent character, takes place into the substance of the tuber annulare, or bursts from thence and spreads along the basis of the skull. (Serres.) The existence of hemiplegia may, in general, be readily detected by the distortion of the mouth; for, however profound the apoplectic stupor may be, more or less deviation from the natural position of the mouth is almost universally present.

Treatment.—The main object to be kept in view in the treatment of apoplexy, is the removal of the vascular turgescence within the head. This fundamental indication is to be answered by a prompt reduction of the general mass and momentum of the blood; and by the employment of means calculated to lessen the determination of the blood to the brain, and to derive it from the cerebral vessels.

In the actual paroxysm of apoplexy, the patient should be immediately removed to an airy and cool situation, and placed in a position which least favors

* In explanation of this fact, M. Bricheteau observes, "An attentive study of the vascular system of the brain shows us that a number of arteries penetrate directly into these parts—the corpus striatum, &c.—without dividing themselves in the pia mater, as the other vessels do which serve to nourish the brain. In consequence of this they are without any additional membranous support in the middle of the cerebral mass, the consistence of which is but illy calculated to support them against the impulse of the blood."—*Loc. cit.*

the flow of blood to the head. All ligatures, particularly those about the neck, should be speedily removed, and his head and shoulders supported in an elevated position. In this posture, a large orifice should be made into a vein, and the blood suffered to flow until a very decided impression is made on the pulse, at the same time that cloths, wet with *cold water*, are applied to the shaven scalp, and warm or stimulating applications—such as fomentations, sinapisms, or frictions with tincture of capsicum—made to the legs and feet. Cups may also be very beneficially applied to the temples and back of the neck, conjointly with the means just mentioned. Some advise bleeding from the temporal artery or the jugular vein in preference to brachial venesection; but others do not regard this preference as founded on good grounds. It is, nevertheless, very probable that blood promptly drawn from the jugular veins or temporal arteries, will have a more direct and speedy effect in diminishing the sanguineous congestion in the brain, than if it be taken from the arm; and as the accomplishment of this effect constitutes our chief purpose in the employment of blood-letting, we may with propriety adopt this mode of depletion. In whatever way the blood is drawn, little or no advantage will be obtained, unless a sufficient quantity is abstracted to produce a very obvious impression on the action of the pulse; and this effect can seldom be produced without the loss of from thirty to forty ounces of blood at once. If in the course of an hour the pulse resumes its activity, a second venesection should be practised, and repeated afterwards at longer or shorter intervals, as long as the pulse indicates the propriety of further depletion. It is sometimes necessary to abstract a vast quantity of blood before the disease begins to subside. "From six to eight pounds of blood have been taken from a person by no means robust, before the disease began to yield."* I have myself drawn five pounds of blood from an apoplectic patient in the course of six hours after the seizure with entire success. In the employment of blood-letting we may suffer ourselves to be guided by the pulse, as has just been stated. Nevertheless, the judicious practitioner will regulate the extent to which this evacuation is carried, not only by its effects on the pulse, but by an attention also to the age and constitutional habit of the patient. I have met with a case of apoplexy which ultimately proved fatal, in which the loss of thirty ounces of blood produced, almost immediately, much feebleness of the pulse. The patient was a female, beyond the seventieth year of age.

Leeching is of no service beyond what may result from the general diminution of the circulation. Cupping, however, is a most important auxiliary.† After an efficient venesection, the application of cups along the temples and back of the neck, or to the shaven scalp, will sometimes speedily rouse the patient from his stupor.‡

The application of ice, or very cold water to the scalp, is one of the most useful remedies in this disease. This was a favorite measure with Thilenius,§ and his praise of its powers, though great, can scarcely be deemed extravagant. Its efficacy will be much enhanced by the simultaneous application of warmth, or stimulating frictions to the legs and feet. Of course, where the pulse is feeble, and the countenance pale, cold must be cautiously applied, but stimulating and warming applications to the lower extremities are always proper. Formerly,

* Cheyne.

† I very much admire the mode of cupping recommended by Mr. Wallace.(*a*) It is as follows:—A cupping-glass having been exhausted in the usual way, is applied to the surface until the skin is sufficiently raised. A very sharp gum lancet is then to be lightly and rapidly drawn over the skin, so as to make superficial incisions about the sixth of an inch from each other, over the whole surface raised by the exhausted cup. These incisions should be so slight as to be scarcely visible. The moment the cupping-glasses are reapplied, the blood will be found to stream from them with surprising rapidity.

‡ Dreysig, loc. cit., p. 481.

§ Medicinische und Chirurgische Bemerkungen, p. 62, et seq.

(*a*) A Physiological Inquiry into the Action of Moxa, &c. By Mr. William Wallace, M. R. I. A., Surgeon of the Charitable Infirmary of Dublin, &c. &c., p. 62.

blood-letting was regarded as of very doubtful propriety in this affection; but at the present day its usefulness, or rather its indispensableness, in every case of genuine apoplexy, is universally acknowledged.

Active purgatives also are among our most efficient remedies in this affection. As the advantages derived from them depend, no doubt, in most instances, chiefly on the tendency they have to direct the circulation more particularly to the intestines, and to excite a free secretion from their internal surface, and consequently to diminish the afflux of blood to the head, it is evident that the more rapidly they operate, the more beneficial will be their influence. On this account, as well as from the great intestinal torpor which prevails in this affection, it is necessary to employ the most active articles of this class of medicines. It is, however, often extremely difficult, and in violent instances, sometimes impossible to administer cathartics by the mouth, from the paralyzed state of the organs of deglutition. Where the power of swallowing is wholly destroyed, we may introduce a purgative fluid into the stomach through an elastic stomach tube. Calomel and extract of jalap are recommended by Sir Gilbert Blane as the best purgative in this affection. Calomel and colocynth form also a suitable purgative. I have used the oil of croton, rubbed up with a little gum Arabic and water, with excellent effect in two instances of apoplexy. This article generally acts with much energy, and from its small bulk and fluidity, is more easily introduced into the stomach than other remedies of this kind. Castor oil with turpentine, also forms an excellent purgative in this disease. At the same time that cathartics are given by the mouth, active purgative enemata should be repeatedly administered. For this purpose we may use a solution of aloes in warm water, in the proportion of from thirty to forty grains to the pint of water; or a strong infusion of senna. Richter advises a solution of tartar emetic for this purpose. Where the vascular reaction is vigorous, this solution may be peculiarly serviceable, by the nausea and consequent reduction of arterial excitement which it is apt to produce, as well as by its evacuant effects on the bowels.

Purgatives are particularly useful where the bowels are in a loaded condition. Dr. Abercrombie relates some instances of this disease, in which blood-letting afforded but very little advantage. As soon, however, as the bowels were freely evacuated, a very obvious improvement took place. Where the inordinate flow of blood to the brain is caused or supported by intestinal irritation from accumulation of feculent matter, or the presence of vitiated secretions, it would seem in vain to expect decided benefit from bleeding or any other remedy, unless the bowels are freely moved; and it is in such cases especially that cathartics are of primary importance.

Formerly *emetics* were much extolled for their remedial powers in apoplexy. Van Helmont, Riverius, Stoll, and Burserius, placed much dependence on them in the treatment of this disease.* Since the time of Cullen, however, they have been generally abandoned, as much more calculated to do mischief than good.† Unquestionably, as a general rule, emetics must be regarded as hazardous remedies in apoplexy; for the tendency of vomiting to propel the blood to the head is always very considerable. Nevertheless, this disease may occur under circumstances of gastric irritation, which may not only render emesis useful, but absolutely indispensable to success. When the apoplectic seizure occurs soon after taking a very full meal of stimulating food, an emetic ought undoubtedly to be given. But even under the most urgent indications for the exhibition of an emetic, a copious and efficient abstraction of blood should always be premised. A few years ago, I met with a striking instance of the usefulness of emetics in apoplexy, under the circumstances just mentioned. A robust man, about fifty years of age, fell down in a fit of apoplexy about an hour after he had taken a very full meal of animal food, with several glasses of brandy and water. The coma was

* Burserius. Inst. Med. Pract., vol. iii, § 131, p. 106.

† See Lond. Med. and Phys. Journ., vol. v. and vi., for an ample discussion on this subject.

profound, and the respiration stertorous and sputtering. He was immediately bled to the extent of about forty-eight ounces, but although the pulse was considerably reduced, no perceptible improvement ensued. Twenty grains of sulphate of zinc were with difficulty introduced into his stomach, and free vomiting ensued in about ten minutes after. Almost immediately after the contents of the stomach were thrown off, he became better; and by the use of purgatives, enemata, and cups to the head, he recovered without any further difficulty.* Dr. Gregory says, "in certain cases vomits are proper; but they should never be given till after large evacuations by blood-letting. They are the most proper where the disease proceeds from a surfeit; and in *serous* habits vomits are very efficacious."† Authors generally advise the mildest emetics in cases where they are indicated. Heberden gave a weak infusion of chamomile: Cheyne used lukewarm water with hartshorn; and others recommend warm water with mustard. It is very questionable, however, whether any peculiar advantages attend the use of these milder emetics. Indeed, the system is almost always so insensible to the impressions of medicines that nothing but the most active articles in large doses, will procure emesis. Where there are indications present to justify the exhibition of an emetic, the more promptly the stomach is evacuated the better. Richter, who speaks very favorably of the employment of emetics in cases of this kind, advises the most active articles of this class.‡

Blisters do not appear to afford any advantage in apoplexy, unless the pulse is weak, small, and quick, which, though rarely, is sometimes the case, in old and enfeebled persons of leucophlegmatic habits. At all times, however, it is better to apply them to the ankles and wrists than to the head or back of the neck.

It is scarcely necessary to say, that stimulants are decidedly improper in the early period of apoplexy. Where, after copious evacuations, some degree of consciousness and a power of voluntary motion return, with much prostration and a feeble pulse, some benefit may, perhaps, be obtained from the cautious exhibition of the carbonate of ammonia or camphor, (Richter,) in the form of a mucilaginous mixture.

The prompt and judicious employment of the foregoing means embraces everything that may be deemed efficient in the remedial management of apoplexy. From whatever cause the disease may arise, our whole efforts should be directed to the removal of the inordinate vascular action or turgescence within the head. Some modifications in the mode of employing the measures mentioned, according to the general constitutional habit, the age, and the character of the exciting causes, will of course be necessary. Thus, in cases which succeed the sudden suppression of habitual hemorrhoidal discharge, some peculiar advantage may, perhaps, be gained from the application of leeches to the anus; if the healing up of old ulcers on the lower extremities appears to have given occasion to the apoplectic seizure, blisters, issues, or sinapisms to these parts will be proper; and I have already spoken of the usefulness of emetics when the attack takes place soon after a surfeit, and the indispensableness of cathartics when the bowels are loaded with feculent and other irritating matters.

During convalescence from apoplexy, nothing but the lightest unirritating diet should be allowed; and unless great prostration exists, all kinds of vinous liquors should be interdicted.

* [I have repeatedly met with such cases. Indeed, in the majority of violent apoplexies I have observed that undigested crudities have caused the disease. A robust and corpulent gentleman of this city has experienced three violent seizures under my care, from all of which he has been promptly relieved by active emetics following previous venesection. No paralysis occurred after these attacks. A patient of the late Dr. Klapp had been several days totally insensible and prostrate from a severe attack, when he was suddenly and completely relieved by the discharge of a soused pig's ear, under the action of an emetic.—Mc]

† MS. Lecture as quoted in the Med.-Chirurg. Rev., June 1820, p. 26.

‡ Med.-Chir. Bemerkungen, b. ii. p. 109.

The *prophylactic* management, in persons laboring under the usual premonitory symptoms of apoplexy, or constitutionally predisposed to this affection, constitutes a very important point of medical attention. A simple, abstemious diet, exercise in the open air, and the avoidance of all kinds of stimulating drinks, as well as of sudden and violent mental excitement, are among the most important precautionary measures in cases of impending apoplexy. If the bowels are torpid, and cannot be brought to a regular state by vegetable diet, it will be necessary to use an occasional dose of some mild laxative, as castor oil, or small portions of rhubarb; and where there is reason to suspect hepatic torpor or derangement, three or four grains of blue pill with a few grains of pulvis antimonialis, taken occasionally at night on going to bed, will be useful. When alarming premonitory symptoms come on, with an active, full, and hard pulse, blood should be immediately drawn to an extent sufficient to reduce considerably the momentum of the circulation, and a brisk cathartic administered. It should be recollected, however, that blood-letting affords only temporary benefit. A copious abstraction of blood may obviate an approaching attack of this disease, but frequent venesection will do little or no good in preventing that general plethoric habit which is favorable to the occurrence of this affection. This must be done by abstemious living; and above all, by an active course of life.

Persons predisposed to apoplexy from corporeal conformation, should be particularly careful not to interfere with, or check hemorrhoidal discharges, unless they become excessive. The same precaution is necessary with regard to epistaxis in individuals of the apoplectic habit, as well as with other habitual evacuations.

Drs. Cheyne* and Stoker† recommend the internal use of small doses of James's powders, or pulvis antimonialis, where there is an habitual tendency to inordinate sanguineous determinations to the head. In one instance of this kind, I have known the daily use of two grains of James's powder, mornings and evenings, of unequivocal benefit. Green tea also is said to possess the power of diminishing or obviating cephalic congestions. Drs. E. Percival‡ and Stoker strongly recommended it for this purpose in comatose affections; and my own experience leads me to think that it possesses considerable powers in this way. Coffee, however, is decidedly injurious where there is an apoplectic tendency. Some eight years ago, a gentleman in this city, of a strongly developed apoplectic habit, was seized with an attack of this affection. He was in the habit of taking large quantities of very strong coffee twice daily. I advised him to leave off taking this beverage entirely. He did so; and has not since experienced even the ordinary premonitory symptoms of the complaint. Apoplectic subjects should be very careful not to bathe their feet in very *cold* water—more especially when they are subject to habitual perspiration from these parts. The frequent use of the warm bath also is hazardous in persons of this habit; and excessive venereal indulgence is equally apt to do injury.

Sect. II.—*Paralysis—Palsy.*

Palsy consists in impaired or abolished power of voluntary motion, or of sensation, or of both, in certain parts of the body, without coma, or a loss of consciousness. Cases in which both sensibility and the power of motion are at once destroyed, are however, extremely rare. Instances even occur in which the sensibility of the palsied part is morbidly increased. I have met with a case

* Dublin Hospital Reports, vol. i. p. 315.

† Dublin Medical Essays, anno 1806. Transactions of the Association of Fellows and Licentiates of the Queen's College of Physic. Dublin, vol. ii.

‡ Dublin Medical Essays, vol. ii. p. 44.

of this kind.* The patient had lost all command over the muscles of the lower extremities; but the sensibility of the skin from the knees downwards was so great, that even moderate pressure with the fingers gave rise to considerable pain. An instance is related in a recent French journal, in which the surface of the paralyzed limb was entirely insensible, but the muscles beneath were the seat of acute pain, which was always much increased by pressure.† In general the paralyzed parts become soft and flaccid, and at last usually emaciated, or occasionally œdematous. Sometimes a peculiar tingling, or creeping sensation (*formicatio*) is felt in the affected parts, "as if small insects were creeping over them." The opinion generally entertained, that the temperature of the palsied parts is lower than natural, does not appear to be founded on correct observation. It is true, we frequently find such parts cooler than the rest of the body; but this would seem to depend on the loss of power in the paralytic part to maintain its specific temperature; in other words, to resist the physical laws of the distribution of heat, in consequence of which, such part becomes cooler when exposed to a temperature below that of the human body, and warmer than natural, when exposed to a temperature above this point.‡ Patients sometimes complain of a sense of severe cold in the affected parts, although to the touch the temperature does not appear to be materially diminished. In some instances the pulse is smaller and weaker in the paralyzed limb than in the healthy one; sometimes, however, it is fuller and stronger in the affected than in the sound side; and frequently no difference whatever can be perceived in this respect.

When palsy arises from disease of the encephalon, it is generally attended with an evident impairment of the mental powers—amounting, in some instances, to complete imbecility. The memory especially is apt to suffer in this affection; and sometimes in a very singular manner. Individuals affected with cerebral palsy, have lost the power of recollecting particular words, numbers, letters, localities, or even their own names; whilst in other respects no material defect was manifested in this faculty. The natural temperament and disposition also sometimes suffer a total change from a stroke of palsy. Individuals of amiable and placid dispositions have become sullen, peevish, irascible; and persons of an irritable and passionate temperament have been rendered mild and simpering by a paralytic seizure. (Cook.)

Paralysis has been known to occur periodically. A case of palsy is related by Musgrave, (*Philosoph. Transact.*,) which regularly returned every eight days, and continued each time to the fourth day. A similar instance of paralysis is recorded by Dr. Battaille, of Paris. (*Ann. de la Médécine Physiolog.*, December, 1829.) It was a quotidian hemiplegia, with perfect intermissions of five or six hours, and was cured by the use of quina. The duration of palsy is very various. Occasionally the affected muscles recover almost entirely their healthy powers in a few days; but the progress of amendment is much more commonly very gradual and slow. It is a singular fact, that the extreme parts of a paralyzed limb are often the first that manifest any degree of returning muscular power. I attended a hemiplegic patient about two years ago, for three weeks, without any apparent amendment; at last, however, he found that he could move his toes;

* [This is satisfactorily explained by the anatomy of the two classes of nerves—muscular and sensitive. The cause of paralysis may act on the tractus of the spinal cord, which gives origin to the muscular roots, and paralyze the motions alone, while the sensibility is unimpaired. The opposite condition may also be the case. Moreover the origin of one class of nerves may be irritated, and the other compressed, or otherwise paralyzed. Thus the muscles may be thrown into inordinate contractions when they are destitute of all feeling; and the limbs may be very painful when they are totally deprived of all the power of motion.

I was accustomed, in my lectures on surgery, to divide paralysis into two kinds—neuralgic or rigid paralysis, and atonic palsy or paralysis attended with relaxation. The first arising from irritation or inflammation of the nerves or cerebral substance which gives them origin, and the second species from compression or loss of tone in the same parts.—Mc]

† Med.-Chir. Rev., October 1829, p. 168.

‡ Dr. Abercrombie.—See Cook on Nervous Diseases, p. 227. Boston, 1824.

by degrees he regained the power of moving the foot, then the leg, and finally the thigh. The same progress of amendment occurred in the paralyzed arm. The power of motion began in the fingers, and gradually extended upwards.

When palsy occurs in the whole of one side of the body, it is termed hemiplegia; if both the inferior extremities, from the hips downwards, are paralyzed, it is called paraplegia; and when only some one particular part is affected, it constitutes the *paralysis partialis* of authors. Paralysis, without coma, affecting the whole body, is an extremely rare occurrence. Cases of this kind, however, have been recorded. A very curious instance of general palsy occurred lately in one of the Parisian hospitals. The paralysis in this case commenced in the feet, and gradually ascended towards the body; when it had arrived at the knees, the palsy seized also upon the hands, and slowly passed upwards to the trunk; finally, every voluntary muscle, excepting those of the face, neck, and tongue, became paralyzed. The patient's general health was good, and his intellect perfect.* Tissot relates an instance of a boy who, apparently in consequence of a repelled scabby affection of the head,† became paralytic throughout nearly the whole of the muscular system, attended with much torpor of the sensorial functions, and mental weakness, though wholly free from coma or somnolency.‡ M. Bretonneau has related a somewhat similar case. "A lady was seized with paralysis of the little finger of the left hand, which gradually extended to the whole of that side; the right became similarly affected, with the exception of the thumb and two fingers. The whole body was thus palsied—the tongue was motionless, and deglutition extremely difficult: but her intellectual faculties remained unimpaired."§ Cook mentions a case, from a publication of M. Keratry, in which there was paralysis of the "arms, thighs, and of the whole exterior surface of the body, with the exception of the face."

1. *Hemiplegia.*

This is by far the most common of those forms of palsy which depend on oppressed function of the sensorium commune. In its essential pathological character, it does not appear to differ materially from apoplexy; and it occurs frequently as an immediate concomitant of this disease. Hemiplegia is almost always ushered in with more or less distinctly marked apoplectic symptoms.

Occasionally the hemiplegic attack occurs suddenly, without any distinct manifestations of its approach. Much more frequently, however, some of the ordinary premonitory symptoms of apoplexy precede the attack for several days; and just before the seizure, strong symptoms of sanguineous determination to the head, and cerebral disturbance, are particularly apt to occur—such as flushed face; distension of the veins about the head and neck; vertigo; a sense of fullness, weight, and sometimes pain in the head; ringing in the ears; drowsiness; impeded articulation of words, or loss of speech; slight delirium, or confusion of the mind; loss of memory, and a change of habitual disposition. M. Serres

* Medico-Chirurg. Rev., Oct. 1829, p. 168.

† [The late Mr. D. Perrine, of this city, had been cured of a chronic rheumatism, which was followed by a troublesome papulary eruption and pruritus over the trunk. As I attributed these symptoms to the previous use of the tincture of guaiacum, I advised him to avoid external applications, and depend upon the mineral waters of Virginia, which he was about to visit. A physician there, however, recommended astringent washes, and other repellents, which speedily relieved the eruptions and the irritation In a few days afterwards he attended a trial in court, and found himself unable to rise or move as the audience were going out. A severe attack of hemiplegia followed, from which he could not be recovered until I re-excited the eruptions and pruritus by the internal use of tr. guaiacum and external irritants. Severe pruritus continued for several years after, especially in his nose, and the paralysis did not return. He eventually died of hydrothorax—Mc.]

‡ Medical Works, vol. iv. p. 552.

§ Med.-Chir. Rev., Oct. 1826, p. 604. Clinical Report of the Hospice de Perfectionnement. Rev. Médicale, 1826.

states that he has noticed, in cases that came on gradually, distortion of the mouth for several hours before the hemiplegia supervened; and immediately before the seizure, he has sometimes remarked, that in the act of respiration, one side of the chest was quiescent, whilst the other was very conspicuously dilated and contracted.

The reproductive or vital functions are seldom much disturbed in the ordinary cases of hemiplegia. In some instances, however, the whole track of the alimentary canal is extremely torpid, and it would appear that the liver is sometimes affected.* The countenance generally acquires a vague or fatuous expression; the mouth is drawn to one side; the lower lip on the palsied side hangs down, and suffers the saliva to dribble away. Articulation is always more or less difficult and indistinct; the deglutition is generally somewhat impeded and difficult—more especially on attempting to swallow liquids. It is in this form of paralysis, particularly, that the mind is apt to suffer from the long continuance of the disease. General impairment of the intellectual powers usually occurs; but the memory is most apt to become conspicuously enfeebled, and even wholly effaced.

Very remarkable anomalous circumstances are sometimes connected with hemiplegic affections. Cook has collected a great variety of curious cases of this kind. An instance is related, in which the arm of one side and the leg of the opposite one were palsied, (*Fabricius;*) another where the sensibility, but not the power of voluntary motion, was destroyed in one leg, whilst in the other the power of motion was lost, with the sensibility unimpaired. (Ramazzini.) Cases are reported in the Memoirs of the Royal Academy of Sciences, in which there was an entire loss of sensibility, without any impairment of voluntary motion. In some instances the sensibility is morbidly increased. Falconer mentions a case in which cold bodies communicated the sensation of heat to the palsied parts; and in the case of Dr. Vieusseux, (*Med. Chir.-Trans.*, vol. ii. pp. 216, 217,) the right side was at first so insensible that it could be pinched or pricked without giving him pain; afterwards this insensibility seized on the left side. In the right side cold bodies excited the sensation of heat, and hot bodies that of cold, or only coolness. Dr. Cook has seen a case of hemiplegia, in which the muscles of the left arm, from the shoulder to the elbow, were much emaciated, and greatly impaired in activity, whilst those of the forearm were in a perfectly natural state, both as to fullness and power. The condition of the right arm was directly the reverse; the muscles of the part above the elbow were natural in size and energy, but those of the forearm were wasted and powerless.

In some instances little or no improvement takes place, and the patient remains helpless, often for a long time, and at last dies, either from gradual exhaustion, or suddenly from apoplexy. More commonly, however, more or less amendment slowly occurs, until the patient is perhaps able to support himself with but little aid in a sitting posture, or even to walk about, with some assistance, without any further improvement. Occasionally the paralysis passes off almost entirely in a few days; but the progress of improvement is usually very slow and gradual, and rarely goes on at once equally throughout the whole of the paralyzed part.

2.—*Paraplegia.*

The palsy, in this form of the disease, is confined to the lower half of the body—that is, to the pelvis and the inferior extremities. When the immediate cause of abolished nervous function is seated in the upper parts of the spine, the paralysis, will effect the superior parts of the body; but the term *paraplegia* is generally restricted to palsy of the inferior extremities, and parts about the pelvis.†

* Morgagni, Epist. xi., art. xiv.

† [Paraplegia of the superior extremities alone is a very rare disease. It can only arise from

Paraplegia generally comes on gradually, and when it arises from an affection of the brain, is often preceded and accompanied in its course by pain in the head, giddiness, drowsiness, dimness of sight, and impaired memory. Sometimes a feeling of heaviness and numbness is felt in the upper extremities, as a precursory symptom of this form of palsy. At first the patient usually experiences a slight stiffness and awkwardness in the motions of the lower extremities, which gradually increase until the patient finds himself unable to maintain the due balance of the body without the aid of a cane. As the disease advances, "the stream of urine becomes more and more feeble, and at length dribbles off involuntarily." The bowels are generally constipated; but when the sphincter muscles of the anus become paralyzed, the feces are evacuated without the consent of the will. I have met with an instance of paraplegia, in which retention of the urine took place, requiring the use of the catheter five or six days before any paralytic affection was experienced in the lower extremities. Sometimes the palsy is complete, the patient being unable to maintain even a sitting posture; in other cases the power of motion is not wholly destroyed, so that with a little assistance the patient may support himself in a sitting position. (Baillie.*) When paraplegia depends on disease or lesion of the spinal marrow, it usually approaches very gradually, unless it occurs as the immediate consequence of some mechanical injury of the spine. The patient at first feels a languor and weakness in the knees; after some time a difficulty in directing the feet occurs, and the legs in walking are involuntarily thrown across each other, causing frequent tripping or stumbling. By degrees the insensibility and loss of muscular power in the legs and thighs become more and more conspicuous, until, at length, a total paralysis of these parts occurs. The loss of vitality is sometimes so great, that gangrene and sloughing of the legs ensue from the mere pressure of the parts against the bed. About six years ago, I met with a case of paraplegia in an adult, which, from the attending symptoms of cerebral disturbance, depended, I presume, on some affection of the brain. In the course of about ten days after the accession of the paralysis, the heel first, and then rapidly all the soft parts of the right leg, from the ankle to near the knee, became gangrenous, and sloughed off to the bones.

Paraplegia from cerebral affections most commonly occurs after the forty-fifth year of age, and, according to the observations of some, more frequently in males than in females. That variety of paraplegia which depends on disease or injury of the spine, is most common in childhood, and seldom comes on spontaneously after the age of puberty. Contrary to cerebral paraplegia, it occurs more frequently in females than in males.†

3.—*Paralysis Partialis.*

Every sensitive and motive part of the animal system may lose either its power of feeling or of motion, or of both. In some instances the palsy is confined

an injury, or disease of the brachial nerves, after they have left the spinal cord. If the cervical portion of the cord itself is injured, a paraplegia of all the parts below must follow.

I have met two cases of paraplegia of the arms, both of which followed concussions from falls on the shoulders. The spinal cord could not have been seriously injured, or the patients could not have walked to visit me at my office. I took it for granted that a concussion must have been communicated to the brachial plexus on each side, for both arms were paralyzed. One of them was a gentleman in Roxborough; the other was the late Mr. Somerdyke, of this city. I will take some future opportunity to communicate the details of these interesting cases to the profession. I will now merely remark that, although relaxed and flabby at first, their arms became rigid and painful in a few days, plainly exhibiting the development of inflammation in the brachial nerves, and converting the original atonic paralysis from concussion into a rigid or neuralgic paralysis from irritation.—Mc.]

* Observations upon Paraplegia in Adults. By Matthew Baillie, M. D., in the sixth volume of the Medical Transactions of the London College of Physicians.

† Dr. C. Meigs has reported an interesting instance of paralysis of the inferior extremities, occasioned by the sudden repulsion of *crusta lactea* by some drying ointment.—(*North Amer. Med. and Surg. Journ.*, vol. x. p. 376.)

to a particular organ, but when the muscles are the seat of the affection, it generally embraces either all the flexors or extensors, or both, of a part or the whole of a limb. Some cases of partial paralysis are attended with loss only of sensorial power. Of this kind are the paralytic affections of the olfactory nerves, of the retina, of the gustatory nerves, of the auditory nerves, and of the nerves of general feeling or touch. In other cases the palsy is confined to a deprivation of the power of motion, with or without the loss of sensibility, in a particular part. In some instances a single muscle alone is paralyzed.* Abercrombie mentions a case of this kind, which continued for a long time without either extending to other muscles or becoming better. Paralysis of the muscles of one side of the face is by no means uncommon, and in some cases the under lip only becomes thus affected. The eyelids also sometimes become palsied; and a loss of the power of voluntary motion in the muscles of the hands, feet, fingers, wrists, legs and thighs, is of frequent occurrence. The bowels, the œsophagus, the pharynx, the bladder, the different sphincters, and the erector muscles of the penis, are occasionally affected with palsy; and it is not improbable that some of the secretory organs—particularly the kidneys and liver—may sometimes be thus affected.

Of the causes of paralysis.—The *predisposing* and *exciting* causes of those forms of palsy which arise from an affection of the common nervous centre, so far as they can be ascertained, do not differ from those which have already been mentioned under the head of apoplexy. In relation to the immediate cause of palsy, it would seem that so far as it is dependent on the state of the brain, it may be the consequence of a great variety of morbid conditions of this organ.

It has been generally supposed that *pressure* on the brain is the chief immediate cause of hemiplegia. That sanguineous or serous effusions, and other causes producing pressure on the brain, often give rise to paralysis, appears to be well established. "When the causes which produce cerebral pressure act generally and powerfully," says Dr. Cook, "they seem to produce apoplexy, and to give occasion to palsy when they act partially or with less violence; so that by an increase of power of the cause, palsy may terminate in apoplexy; and by a diminution of it, apoplexy may terminate in palsy." Hemiplegia is, indeed, a very frequent consequence of apoplexy; and, on the contrary, paralysis very often terminates at last in an apoplectic attack. It is, nevertheless, equally well ascertained, that both general and partial palsy may arise from cerebral affections wholly unconnected with any circumstances that might be supposed capable of exerting any pressure on the encephalon. Reasoning, indeed, upon the general nature of palsy, we should be led, *à priori*, to suppose that everything which is capable of greatly disordering the source of nervous power might give rise to this affection. Dr. Powel, in an interesting paper on the subject of paralysis from sudden exposure to cold, has adduced some cases which would seem to show that both general and local palsy sometimes depend on a morbid condition of the *nerves alone*, independent of any affection of the encephalic mass. So far, however, as post-mortem examinations can throw any light upon the nature of the proximate cause of general paralysis, we have direct evidence that almost every variety of cerebral lesion and disorder may produce hemiplegia and other forms of palsy. We not only find this affection connected with sanguineous extravasation into the brain, but also sometimes with serous effusion; or with traces of recent inflammation and vascular turgescence; with encysted suppuration; with induration of some portions of the cerebral mass; with softening of the brain, or with destruction and entire loss of a portion of it; and with other morbid conditions of this organ. (Abercrombie.) Willis states, that in cases of protracted palsy, he found the corpora striata in a diseased condition; and Peyrous, in one instance, found a firm tubercle, about the size of a bean, in the middle of the corpus striatum. (Cook.) But the

* [The deltoid is especially liable to this affection.—Mc.]

most frequent morbid appearance, discovered on dissection, is organic lesion or injury of the cerebral substance, particularly about the corpora striata, thalami nervorum opticorum, and in the medulla oblongata or its immediate vicinity. M. Serres mentions a case of apoplexy attended with palsy, in which every part of the brain was perfectly sound, except the tuber annulare, which was completely destroyed by a central cavity containing a clot of blood. Although some of these phenomena usually present themselves on the dissection of paralytic subjects, yet each of these morbid conditions of the brain not unfrequently exists without any, or with but very slight manifestations of palsy. There exists also much diversity in the extent and particular form of the paralytic affections connected with the apparently similar morbid states within the brain. In one patient, a particular lesion or diseased condition of the brain will be attended with almost universal palsy; in another, a similar state of cerebral affection, with regard to its location and general character, will be accompanied with hemiplegia; in a third patient, perhaps, with paraplegia; and in a fourth one, with partial paralysis. It would appear, also, that in hemiplegia, the immediate cause of the paralysis may be in the spine. Dr. Prichard has published some observations which render this opinion at least highly probable.* Notwithstanding, therefore, the light which dissection has thrown on the etiology of palsy, we are yet far from possessing any very satisfactory or precise information on this interesting subject. The general fact, that pressure or organic lesion of the brain is often attended with paralysis, and apparently its direct cause, is, indeed, sufficiently established; but the various and opposite results or phenomena just mentioned, assure us that our knowledge upon this subject, as in truth upon most other points of pathology, is but general and vague.

What has been hitherto said relates chiefly to hemiplegia. It would appear that paraplegia also is frequently dependent on cerebral disease. Paraplegia in adults, says Dr. Baillie, is by most pathologists considered as the result of some disease "either in the bones or ligaments of the spine, or in the cavity of the spine, most commonly at the loins, independently of any disease of the brain."† He denies the correctness of this opinion, and expresses his conviction that, like hemiplegia, this form of palsy "depends most commonly in adults, in a great measure, upon disease affecting the brain itself." The same sentiments appear to be entertained by Mr. Earle, Mr. Halford and Mr. Copeland;‡ and several recent French writers have expressed similar views. Dr. Baillie and Dr. Abercrombie relate cases of paraplegia, in which, on dissection, the cause of the disease was discovered in the brain. In a strongly-marked case, the arachnoid was much thickened and opaque; the substance of the brain was considerably softer than natural, attended with vascular congestion of the pia mater, a large quantity of serum in the lateral ventricles, as well as in the theca vertebralis, and between the membranes of the brain. Dr. Baillie thinks that the serum which is sometimes found in the theca vertebralis in this affection, descends into it from the brain. We cannot doubt that paraplegia may sometimes be entirely dependent on cerebral disease; yet observation renders it equally certain that disorder, lesion, or pressure upon the spinal cord is, even in adults, very frequently the immediate cause of the paraplegic affection; and in children this is unquestionably by far the most common source of the disease. In relation to the disease in adults, a great number of well-authenticated dissections might be adduced, presenting unequivocal evidence of its spinal origin; and facts illustrative of this point, in reference to the disease in children, must be familiar to every one. It has already been observed, that paralysis depending on the disease of the brain, occurs almost universally on the side opposite to that in which the cerebral affection exists. Some exceptions, indeed, to this fact have been noticed by pathologists, but these are extremely rare. Mr. Bayle has

* Med. Repository, No. 1, New Series.

† Loc. cit., p. 17.

‡ Med.-Chir. Rev., December 1820, p. 392.

collected, from different authorities, eight cases in which palsy took place on the same side of the cerebral affection.* When paraplegia depends on disease seated within the head, the primary affection extends probably to both sides of the brain. This opinion is at least strongly countenanced by the phenomena developed on post-mortem examination. (Baillie.)

Partial paralysis depends on a great variety of causes both of a general and local character. It may depend on disease within the head, on spinal affections, and disease or local injury of a particular nerve. The latter source of this form of palsy is probably the most common. Local paralysis is sometimes excited apparently by intestinal irritation in children. In cases of this kind, the palsy is usually confined to one of the arms.† I have seen cases of palsy of the arm in young children, which appeared to have been occasioned by the irritation of worms in the bowels.

Much attention has, within a few years past, been bestowed on local paralysis of the muscles of one side of the face. It appears from the researches of Shaw and Bell, that this variety of palsy depends most commonly on some injury of the *portio dura* of the seventh pair; and in some instances, also on a diseased condition of that part of the brain which gives origin to this nerve.‡ The occasional causes of this variety of palsy are, inflammation of the ear spreading to the portio dura; surgical operations about the ear and consequent injury of this nerve; disease of the temporal bone; tumors pressing on this nerve; *sudden exposure to cold*;§ injuries inflicted on the head; and disorganization and other morbid conditions within the brain, implicating the portio dura. The paralysis in cases of this kind is not complete—the muscles of the face being deprived only of "the power of those actions which are to a certain degree involuntary, and to perform which it is necessary there should be a combination with the organs of respiration;" sensibility, and those actions which are derived from the trigeminus, namely, the action of the orbicularis oris, of the eyelids, of the buccinators, and of the muscles subservient to mastication remaining undiminished.‖ Mr. Shaw remarks, that in the paralysis of the face after an attack of apoplexy, just the reverse condition in this respect obtains—the actions just enumerated as depending on the fifth pair of nerves being abolished; whilst those which are influenced by the portio dura remain unimpaired.

Among the exciting causes of partial paralysis, the poisonous influence of *lead* is the most remarkable. The tendency of this article, in whatever way it may be brought to act on the system, to produce paralysis of the muscles of the forearm and wrists, is peculiarly strong, as is evident from the frequency of this affection in persons who work in lead mines, in plumbers, manufacturers of white lead, painters and glaziers. There exists, however, much diversity with regard to the constitutional predisposition of different individuals to become thus affected by this article. Some persons appear to enjoy almost an entire immunity from its poisonous influence, although much exposed to its operation, whilst others are peculiarly liable to its effects.

Paralysis of the extensor muscles of the hands and wrists sometimes occurs, apparently from pressure of the nerves which go to these muscles. Cases of

* Revue Médicale, Janvier 1824.

† C. Bell. See Cook's Treatise on Nervous Diseases, p. 268.

‡ On Partial Paralysis. By John Shaw. Med.-Chirurg. Transact., vol. xii. p. 1.

§ Dr. Powell. Transactions of the College of Physicians, vol. v.

‖ [This is not exactly correct. The portio dura supplies all the voluntary and involuntary motions of the muscles of the face and brow—including the frontal, the corrugator, the orbicularis, the buccinator, &c. The only exceptions are the muscles of the eyeball, the levator palpebræ superioris, and the masticators. Mr. Bell's original statement that the portio dura only controlled the associated or involuntary motions, was incorrect. The fifth pair supplies common sensibility alone to the forehead, eyes and face. The small anterior root of its third branch alone is muscular, and that supplies the masticator muscles solely. The phenomena dependent upon a partial paralysis of the portio dura correspond exactly with this anatomy; and the statements in the text of our author must, therefore, be taken with some modification.—Mc.]

this kind generally come on during sleep, and seem to be occasioned by a particular position of the arm, while the head is resting upon it, and compressing, perhaps, its principal arteries and nerves. I met with a case lately in a young gentleman who fell asleep while sitting at his desk. On awaking he found that he could not extend the hand nor use the fingers; the palsy continued for four weeks before it yielded. Dr. Healy has published an interesting paper on this variety of palsy, in the third volume of the *Dublin Hospital Reports*.

The question why the power of motion is often entirely destroyed whilst that of sensation remains undiminished, has at all times greatly perplexed physiologists. Galen supposed that two sets of nerves were distributed to every part of the body—one to endow them with sensibility, and the other to give to the muscles the power of voluntary motion. What was thus alleged from mere theoretical views by this very sagacious physician, has been recently demonstrated by M. Magendie and Mr. C. Bell. The nerves which originate from the spinal prolongation of the brain, and which supply the power of voluntary motion and sensibility, are composed of two packets of fibres proceeding from distinct parts of the spinal marrow. It has been ascertained that, by dividing or compressing the posterior of the two fasciculi by which the spinal nerves originate, the sensibility of the part to which the nerves go is greatly diminished, whilst the power of motion remains unimpaired; and, on the contrary, if the anterior of these heads of the nerve be divided or materially injured, the power of voluntary motion is destroyed in the parts to which it is distributed, but the sensibility remains unaffected. This physiological fact throws much light on the curious phenomenon in question, and may be regarded as full an explanation of it as anatomical investigations are capable of furnishing on any subject.

Treatment.—The prophylactic treatment of approaching hemiplegia does not differ from that which is proper for warding off an attack of apoplexy. In the apprehensions of a stroke of palsy, a low diet, gentle exercise in the open air, and the avoidance of all kinds of stimulating liquors, as well as of full and heavy meals, should be enjoined; and the bowels kept in regular motion by gentle laxative medicines.

Where predisposition to apoplexy exists, and particularly when the ordinary premonitory symptoms of this affection occur frequently, a drain by means of setons or issues established in the neighborhood of the head, will contribute materially in obviating the paralytic seizure.

Much discrepancy of opinion has been expressed with regard to the value of blood-letting in hemiplegia. Some speak strongly in praise of its powers; while others condemn its use as often decidedly injurious. An attention to the various pathological conditions of the brain in cases of this disease, must at once show the folly of sweeping declarations either in favor of or against this measure. We meet with cases, for instance, in which there are unequivocal manifestations of sanguineous engorgement in the vessels of the head; and with others, in which the face is pale and shrunken, and the pulse small, weak, and irregular. The immediate cause may consist in vascular turgescence with sanguineous extravasation into the brain; or in a slow disorganization of a portion of this organ, with little or no engorgement or inordinate action of the cerebral vessels. *The pulse must be our guide in the employment of this evacuation.* If the artery beats strongly, and is full and hard under the finger, blood should be drawn freely and promptly as in apoplexy, until the momentum of the circulation is adequately moderated. When, on the other hand, the pulse is weak, the extremities cold, and the face pale and contracted, as it sometimes is in old, weak and nervous individuals, blood-letting to any considerable extent is just as obviously contraindicated. In a few cases, I have extracted from forty to fifty ounces of blood in the course of twelve hours after the hemiplegic attack with decided benefit; but I have met with cases, also, in which even a moderate bleeding brought on faintness and alarming weakness, without any favorable impression on the paralytic affection. Of course, even where the state of the circulation indicates the pro-

priety of this evacuation, regard must be had to the age of the patient, his constitutional habit, and the nature of the exciting cause.

Purgatives are as useful here as in apoplexy. In no instance, whether the action of the pulse be strong or weak, can evacuants of this kind be properly omitted. "All writers," says Dr. Cook, "agree as to the propriety of keeping the body open in hemiplegia. The neutral salts and other purgatives of the refrigerant kind may be given where there is much determination of blood to the head, and in full habits; but in debilitated, leucophlegmatic, and dropsical cases, the more stimulating purgatives, such as aloes, calomel, scammony, colocynth, jalap, &c., may with more propriety be administered." An excellent mode of giving purgatives in habits of this latter kind, is to administer them in combination with powdered mustard. From ten to twelve grains of calomel mixed with about twenty grains of mustard, and succeeded in about three hours by a dose of infusion of senna, will rarely fail in such cases to procure free and copious evacuations. In relaxed and sluggish habits, cathartics will almost always operate with more certainty and force when given with a stimulant of this kind. I have frequently, under such circumstances, administered a small portion of Cayenne pepper with purgatives, with excellent effect.

Emetics also are much recommended by some writers in the treatment of hemiplegia. In recent instances, ushered in by apoplectic symptoms, and particularly in robust and plethoric subjects, they are of doubtful propriety. When hemiplegia comes on during a dyspeptic condition of the stomach, or soon after taking food of difficult digestion, an emetic may, no doubt, prove very serviceable. At a more advanced period of the disease, when the momentum of the circulation is moderate, and no symptoms of cerebral congestion exist, emetics will occasionally do much good, and may be freely employed without risk of doing mischief.

In addition to the general remedies already mentioned, revulsive applications constitute important auxiliaries in the treatment of this affection. In recent cases, blistering or cupping the nape of the neck, and sinapisms to the ankles, will sometimes contribute considerably to the removal of the disease.

Stimulating enemata also are highly recommended in this variety of palsy; and I have myself witnessed several instances of their good effects.

In paraplegia, attended with symptoms of cephalic disorder, besides the local applications just mentioned, Dr. Baillie recommends the use of calomel, or the blue pill in union with squills, together with purgatives. He directs a grain of calomel, or five grains of the blue mercurial mass with one grain of dried squills, every night for several weeks, with an occasional dose of one of the neutral purgative salts.

When all the symptoms of undue determination to the head have disappeared, or the disease has assumed a strictly chronic character, antiphlogistic and depletory remedies are no longer appropriate means. Exciting remedies must now be resorted to. Frictions, stimulating liniments, sinapisms, blisters, stimulating baths, cold affusions, electricity and galvanism, are the principal external exciting applications; and, under proper management, they often prove decidedly beneficial. Frictions with the flesh-brush, or a piece of dry flannel, will sometimes answer better than the more irritating or rubefacient applications. The frictions should be made twice or thrice daily, and continued each time at least half an hour. Along with dry frictions, the occasional application of blisters to the leg and wrist of the affected side may prove beneficial. Where the palsy is complete, however, the sinapisms or blisters should not be left on too long, lest gangrene and sloughing be produced. A moderate rubefacient effect is all that it will, in general, be prudent to excite in cases of this kind. Cullen, indeed, observes, that when external stimulants produce violent inflammation, they are apt to do less good than when they act merely as rubefacients, or at most create but a moderate degree of superficial inflammation. Anciently, the application of nettles was much recommended; and from the very pungent irritation they pro-

duce in the skin, they may, no doubt, be serviceable. I have known the application of *dolichos pruriens* to a paralytic limb to be of manifest advantage.

Electricity, being peculiarly adapted to excite the nervous system, has been much employed in the treatment of paralytic affections; and, under judicious management, it will sometimes do much good. I have known several cases of local palsy completely cured by this agent; and the records of medicine furnish us with no small number of instances in which it was successfully employed. It would appear, however, that it has sometimes proved injurious. Mr. Cavallo observes, that electricity has often proved wholly inefficacious in paralysis, and, in some instances, pernicious and even fatal. It seems probable, however, that where it has been followed by unfavorable or fatal consequences, it was applied in too powerful a manner; for it is admitted, on all hands, that it proves most beneficial when it is moderately and repeatedly applied. Shocks should never be given. The electric fluid must be passed through the affected part *without sparks*, by means of wooden points; or, at most, by discharging very weak sparks into it from the prime conductor. Dr. Cook remarks, that this agent "is only to be considered safe when its operation is confined to parts somewhat remote from the head;" and that it is most apt to prove injurious when the disease depends upon disease or compression of the brain.

Galvanism, also, has been recommended for the cure of this affection; and it is said to be safer, and in general, more effectual than electricity. Dr. Bardsley, from considerable experience with the use of galvanism in paralysis, concluded, that if no sensible benefit arise from a steady and well-regulated application of this influence, after a trial of a week or ten days, its use ought to be discontinued; that when the brain forms a part of the galvanic circle, it is to be very cautiously employed; and that when the activity and firmness of the pulse, as well as the temperature of the affected part, are increased, the corporeal and mental feelings somewhat enlivened, and the secretions improved, we may persist in the application of this agent, with the prospect of ultimate and permanent advantage. When the affected parts are so torpid as to render them insusceptible of the galvanic stimulus, the cuticle ought to be removed by a small blister, and the metallic points applied to the raw skin. (Bardsley.)*

M. Roux has practised electro-puncturation with entire success in a case of paralysis of the inferior extremities. He introduced a very long needle (as in acupuncturation) into the spinal marrow, across the bodies of the vertebræ, and then connected the needle with a Voltaic pile. This operation has, of late, been frequently performed for paralysis, chronic rheumatism, &c. Two needles may be introduced so as to bring the principal nerves, distributed to the affected part, within the galvanic circle, and bringing the needles in contact with the opposite poles of a weak galvanic apparatus.

Moxa has been used with success in paralysis. Dupuytren has reported a case of general paralysis, in which moxa applied on each side of the spine, near the first and second dorsal vertebræ, procured immediate benefit. Larry mentions a case of palsy from disease of the spine, which was cured by thirty-two applications of moxa; and two other cases of paralysis of the forearm from gun-shot wounds yielded completely to this remedy. He also states that he cured several cases of paralysis of the muscles of one side of the face from cold, by the application of moxa; but he observes that the application of moxa to this part is dangerous, unless the cones of cotton are small, and suppuration be prevented by the application of ammonia.† The instances on record of the successful application of moxa in paralysis are, indeed, sufficiently numerous to entitle this remedy to particular attention in the treatment of this affection.

Internally a variety of remedies have been recommended for the cure of this disease. Among these the *nux vomica*, or its preparation *strychnine*, has of late

* Medical Reports, p. 183. Cook, l. c. p. 296.

† Recueil des Mémoires de Chirurgie, par le Baron D. L. Larrey, p. 94.

years been a good deal used in palsy, and occasionally with decided benefit.*—Mr. Purcell has recently reported a case of paraplegia, in which this article, in conjunction with the application of moxa, was successfully used.† Professor Giddings, of the University of Maryland, has also reported several highly interesting cases, which yielded to the influence of the strychnine. One of these cases was manifestly the result of sanguineous extravasation into the brain, as its acception was attended with decided apoplectic phenomena. The second was a case of general paralysis, and the consequence, as was believed, of the injurious influence of lead. This article may be given in doses of from one-sixteenth to one-sixth of a grain, three times daily. The dose should, at first, be small, and gradually increased to as much as the system will bear. Since the last edition of this work was published, I have employed this powerful narcotic with complete success, in an obstinate and long-standing case of hemiplegia. It is undoubtedly a remedy of excellent powers in paralytic affections. When the peculiar convulsive motions which result from the operation of this narcotic, appear early in the *palsied limb*, in connection with transient tremors, formication, and free perspiration in this part, and particularly if these affections do not directly pass to the sound parts, the prospect of benefit from this remedy is said to be considerable. In paralytic affections connected with an inflammatory or congested condition of the brain or spinal marrow, and in hemiplegia from sanguineous extravasation into the cerebrum, this remedy cannot be employed without considerable risk of injurious consequences. From two to four grains of the nut may be administered three or four times daily, until spasmodic motions of the extremities ensue, or gastric distress is experienced. The extract is given in doses of from two to three grains; and of the strychnine, which has latterly been used, one-sixth of a grain may be exhibited thrice daily.

Somewhat analogous to the nux vomica is the *rhus toxicodendron* in its occasional effects in paralytic disorders. This article was formerly highly extolled for its remedial powers in affections of this kind, and in Germany it has lately again attracted considerable attention in this respect.‡ In two instances of hemiplegia, I prescribed the saturated tincture of the leaves of the rhus with unequivocal benefit. In a letter to me from Professor Osann, of Berlin, I am informed that the following mixture has been used with decided benefit at the Polyclinic Institute, in paralysis of the lower extremities:

℞.—Tinct. rhois. toxicodend. ℥ss.
—— aconiti ———
—— guaiaci volat, āā ℥ii.—M. S. Take forty drops every three hours.

The effects of this article are often very similar to those which result from the

* Decandolle, Husson, Dumeril, Lescure, Asselin, Magendie, Bricheteau, and Fouquier, have reported cases of palsy in which the happiest effects were produced by the use of this remedy. M. Fouquier gave the nux vomica to the extent of from four to twenty-four grains of the powder daily to an habitual drunkard affected with hemiplegia from apoplexy; and in the course of one month he was entirely cured.

† Medico Chirurg. Rev., November 1829, p.203.—Prov. Med. Gazette, No. xi., July 1829.

‡ M. Dufresnoy, Professor of Botany at Valencia, was, I believe, the first who used the rhus toxicodendron in palsy.(*a*) Mr. Alderson, an English physician, next published a small work on the medical effects of this article, in which he relates seventeen cases which were more or less benefited by its use. Dr. Horsefield, in his inaugural dissertation on different species of rhus, published in this city in 1798, testifies to its usefulness in paralytic affections. Mangrat. (Journ. de Phys. Chim. d'Histoir. Nat., vol. li. p. 370.) Elz. (Dissert. de Toxicodend., 1800), Hunold (Piepenbrings' Archiv. f. Pharmacie, bd. i. st. iii. p. 276), Kok. Van Mons. Augustin (Asklepeion, 1811, No. iv. s. 57), Sybel (Asklepeion, 1811, No. xxxii. p. 497), Gisovius (Rust's Magazine, bd xiv. s. 386), D'Alquen (Harles Rhein-Westphal. Jahrb. ect. bd. x. st. i. s. 135), Osann (Hufeland's Biblioth. d. Heilkund, 1823, Mai, s. 324), Buchheim (Allgem. Med. Annal., 1825), Hennin (Archiv. fur Med. Erfahr. V. Horn, ect. 1823, Nov. and Dec., s. 392), have all published cases illustrative of the remedial powers of this article in different forms of palsy.

(*a*) [Dr. Senter, of Rhode Island, first introduced the rhus toxicodendron to the notice of the profession; and his experience, originally published before the American Revolution, was afterwards noticed in Duncan's Medical Commentaries.—Mc.]

full operation of the nux vomica. In one of the cases in which I used it, the patient experienced occasional convulsive actions in the muscles of the palsied limb, with a sensation of tingling or prickling in the affected part. The powdered leaves may be used, commencing with half a grain, and gradually increasing it to four grains, three times daily. The effects of this article, when given in large doses, are headache, vertigo, nausea, and sometimes profuse diarrhœa, and when these manifestations of its operation ensue, its use must be discontinued.

The *oil of turpentine* is strongly recommended by Dr. Prichard, (*Med. Repos.*, No. 1, New Series,) in paralytic affections, after depletory measures have been adequately pursued. He gives it in doses of from one to two drachms, three times daily. Mr. Manson has related several striking instances of the successful use of iodine in paralytic affections.*

The *flores arnicæ* appear to have been frequently used with entire success in cases of this kind. They are said to be particularly useful in paralysis of the bladder,† and in local palsies of the organs of sense. Richter, indeed, says that they may be used with occasional success in almost every variety of palsy. Hufeland states that he cured a case of scrofulous deafness with this article, in conjunction with antimonials.‡ Within the present year I prescribed this remedy in an instance of hemiplegia, which came on very gradually in an elderly female, and its effects were very manifestly beneficial.§

The internal use of *mustard seed*, and of *horse radish*, has also been recommended in paralysis; and I have known the former of these articles prescribed by the late Dr. Barton, in the Pennsylvania Hospital, with much advantage. A number of other remedies are said to have been employed with success in various forms of palsy. Cantharides in substance, "in the dose of one grain to a scruple of volatile salt, and gradually increased to two grains of the former and forty of the latter, every three hours," have been employed with great benefit. (Cook, *Med. Comment.*, vol. xiii. p. 96.) Dahlberg and Kölpin speak highly of the effects of the *tincture of colocynth*,‖ in doses of ten drops every two hours, and gradually increased to sixty or seventy drops. This tincture is said to be particularly useful in paralysis of the inferior extremities, and of the bladder. Kölpin declares that he has used this remedy with extraordinary success; and many other authorities of respectability might be cited, in favor of its occasional efficacy in this affection. (*Horn's Archiv.*, 1804.) The *chenopodium ambrosioides* is said to have produced excellent effects in *aphonia* from paralysis of the muscles of the larynx.¶ It is given in substance, in doses of from a scruple to half a drachm, twice or thrice daily. Jahn (*Klinik. der Chron. Krank.*, b. i. p. 365) says the belladonna is one of the most efficacious remedies in paralysis. Besides the foregoing remedies, almost every active tonic and stimulant has been recommended in such affections—phosphorus, camphor, volatile salts, valerian, bitters, chalybeates, the essential oils, savin, &c., have all found advocates as remedies in paralytic affections, but they deserve little or no attention in this respect.

In that variety of local palsy which arises from the poisonous influence of lead, the use of mercury, so as to produce moderate ptyalism, in conjunction with the repeated application of blisters, or other active irritating substances to the wrists, and the use of the splint or battledore, recommended by Dr. Pemberton,** with mild aperients, and occasional warm bathing, constitute our most useful remedial means. Dr. Gregory is not willing to attribute any powers to mercury against

* Medical Researches on the Effects of Iodine, &c.—Lond. 1825, pp. 87–90.

† Hufeland's Journal, bd. ix. st. iii. p. 95.

‡ Ibid., bd. xxxiv. st. v. s. 33.

§ The arnica is highly extolled for its virtues in paralytic affections by Junker, Colin, Plenck, and others. (Cook.)

‖ Hufeland's Journal, bd. ii. st. iv. p. 570.

¶ Borries. Ibid., bd. xiv. st. ii. p. 201.

** This consists simply in applying a carved splint to the inner side of the arm, so that the broad surface supports the hand.

this affection, notwithstanding the authority of Dr. Clutterbuck in its favor. I have met with one case in which gentle salivation, with local stimulants to the palsied parts, succeeded in removing the disease. It is not improbable, however, that the chief advantage in this instance was derived from local irritating applications.*

In *paralysis of the tongue*, we may direct the patient to chew the root *pyrethrum*, or other irritating and pungent substances; such as cloves, senega, squills, pepper, calamus aromaticus, &c. The oil of cajeput has also been recommended in this variety of local palsy. A few drops of it are to be put on the tongue three or four times daily. Blisters, or frictions with tartar emetic ointment under the chin and ears, may also be used; and a very moderate excitation of the tongue by the galvanic influence; which may be done by two flat pieces of silver and copper, the one applied to the upper, and the other to the under surface—the parts projecting from the mouth being brought in frequent contact. In *partial paralysis of the face*, cupping, leeching, and blistering over the origin of the portio dura, mercurial purgatives, and a seton in the neck, may be accounted the most efficient remedial measures. Dr. Delafield, of New York, has related several instances of this affection, which yielded under the employment of these remedies.† I have known a case of this kind, produced, or at least accompanied, with indurated swelling of the parotid gland, cured by the use of iodine.‡

Sect. III.—*Epilepsy.*

Epilepsy, whether considered in its immediate phenomena or in its remote consequences, is unquestionably one of the most distressing and deplorable of human maladies. Its tendency to impair the understanding, to produce hebetude, and even total abolition of the rational powers, leads often to a condition infinitely more lamentable than death itself. So frightful and distressing a disease could not fail to attract the particular attention of the physicians of every age; and we accordingly find it minutely described, and its nature and treatment extensively discussed, in the works of the Greek and Roman physicians.§

The soporose and convulsive affections are so closely allied to each other, both in relation to their general phenomena and their pathological character, that it is extremely difficult to give an unexceptionable definition of any of them. Epilepsy may, perhaps, be defined a disease primarily seated in the nervous system, manifested by convulsions recurring at uncertain periods in paroxysm, accompanied by a temporary loss of consciousness, sense, and voluntary motion, and terminating in somnolency.

The epileptic attack sometimes comes on suddenly without any manifestations

* A gentle mercurial action is recommended for the cure of this variety of palsy by *Hunter and Dr. Clarke.* Dr. Clutterbuck regards it as the most effectual means we possess in this affection.

† New York Med. and Phys. Journ., Dec. 1834.

‡ [The portia dura nerve is frequently affected by the influence of a current of cold air, so as to produce a muscular paralysis at the side of the face and forehead. I have known patients afflicted with it on coming up from a damp cellar, and then their friends became alarmed at the distortion of the countenance, and indulged the fears of an apoplexy. I have always succeeded in curing this form of palsy in a few days, by diaphoretics and counter-irritants. Enveloping the whole face and side of the head in carded cotton, and rubbing croton oil occasionally over the course of the nerve, will generally afford speedy relief.—Mc.]

§ Hippocrates describes epilepsy under the name of *morbus sacer*—a name which was given to it from its supposed origin; it being generally regarded at his day as an infliction of the gods or of demoniac influence. Aristotle treats of it under the name of morbus Herculius, because Hercules is said to have been afflicted with this disease. The most common appellation of this affection among the Roman physicians, however, was *morbus comitialis.* We nevertheless find it mentioned also under various other names in their writings—such as *morbus sonticus, morbus caducus, morbus puerilis, morbus insputatus,* seleniacus, major, magnus, vitriolatus, mensalis, &c. In the sacred writings, epileptic persons are called *lunaticos.*

of its approach. More frequently, however, certain symptoms precede the occurrence of the paroxysm, and of these the following are the most common:—A peculiar confusion and distressing feeling in the head; an absent, wandering, and confused state of the mind; giddiness; dimness of sight; ringing and loud sounds in the ears; sparks and flashes of light before the eyes; distension of the veins of the head and neck; a trembling and feeling of restlessness in the extremities; an anxious feeling in the præcordial region; restlessness and starting during sleep; loss of the power of distinct articulation; complete temporary deafness, and drowsiness. In some instances, there is a manifest change in the moral disposition a short time before the accession of the attack. Sullen gloominess with an irritable temper is manifested by some patients. In some cases, the mind falls into a kind of reverie from which it cannot be drawn, which terminates often speedily in total insensibility. Some epileptics evince an unusually timid disposition; others are spiteful, resentful and mischievous, shortly before the accession of the paroxysm. Occasionally, spasmodic twitches of particular muscles, especially in those of the face, precede the attack. Richter states that painful sensations in certain parts of the body, particularly spasmodic pains in the stomach, with a rumbling noise in the bowels, occur as the precursors of the epileptic paroxysm.

The most remarkable of the premonitory symptoms of epilepsy, however, is that which is technically called *aura*. The sensation to which this term is applied, and which, I believe, occurs in no other disease, is compared by patients to the feeling which is communicated by a gentle stream of cool air directed on the part. This sensation generally commences in the feet or legs, and gradually ascends until it reaches the head, when the patients instantly become insensible and epileptic. Some patients are enabled by this symptom to tell with accuracy the nearness of the attack, and to avail themselves of this intimation to place themselves in a situation in which they will be less liable to sustain injury during the attack. Spiculæ of bones, tumors, and foreign bodies pressing upon and irritating some nerve, have been found to exist at the starting point of this singular sensation.* The primary irritation is, however, almost invariably seated elsewhere, and transferred sympathetically to the part in which the *aura* commences.

In many instances, the attack always occurs at night while the patient is sleeping. In this respect epilepsy differs conspicuously from *chorea*, the convulsive motions of which, however violent during the day, are almost always wholly suspended during sound sleep.

When the epileptic seizure occurs while the patient is sitting or standing, he suddenly falls down in a state of insensibility, and immediately becomes more or less violently convulsed. In some cases, the convulsive actions of the muscles, particularly those of the face, are frightfully violent; the whole frame is violently agitated; the eyes roll about; the lips and eyelids are convulsed; the tongue often spasmodically thrust from the mouth, which, with "gnashing of the teeth, and foaming at the mouth, give the countenance a horridly wild expression." Sometimes the teeth are firmly pressed together; at others, the jaws are widely and fixedly distended; the thumbs are almost invariably firmly pressed in upon the palms of the hands. The spasms are generally of the clonic kind; but in some instances, the muscles remain for a time rigidly contracted, the body being bent either backwards, forwards, or to one side, as in tetanus. Occasionally, the abdominal muscles are violently drawn towards the spine. In many instances, there are strong erections of the penis, with spasmodic retraction of the testicles, and occasional seminal discharge. (Richter.) The face is occasionally pale, but more commonly livid with a turgid state of the veins of the head and neck. The heart palpitates rapidly; the pulse is usually contracted,

* Van Swieten's Commentaries, vol. iii. p. 419.—See also Medical Experiments and Observations by a Society, &c., at Edinburgh, vol. iv. p. 334.

irregular and frequent;* and respiration oppressed, laborious, and, in violent cases, sonorous. About the termination of the paroxysm, a considerable quantity of frothy saliva usually flows from the mouth; and in some cases, the feces and urine pass off involuntarily. Sooner or later these spasmodic symptoms abate—generally gradually, but sometimes abruptly. The respiration becomes freer; the pulse fuller and more regular; the countenance more composed; and the patient finally falls into a state of stupor or deep sleep, out of which he awakens with a feeling of languor, and confusion and torpor of mind, which generally continues for ten or twelve hours. The countenance exhibits a vacant and stupid expression, and the eyes are dull, staring and wandering. In violent attacks the mind remains obtuse and fatuous, and the temper irritable and morose, for several days after the paroxysm. During this somnolent state, the patient usually perspires freely, particularly about the head, neck, and breast; and the perspiration has frequently a very peculiarly offensive smell.† The sweating has been known to be distinctly confined to one side of the body only.‡ Epilepsy does not, however, always assume the violent grade just described. Sometimes the attack supervenes suddenly, and after a few moments of partial convulsions of the muscles of the face and neck, quickly subsides, and restores the patient to consciousness. I once attended a girl affected with this disease in so slight a manner that the convulsions seldom lasted longer than a few minutes.

In relation to the duration of the epileptic paroxysm, there exists great diversity. The convulsive stage generally continues from ten to fifteen minutes, sometimes for half an hour, and occasionally for several hours. The paroxysm is most apt to become protracted in children. In most instances one paroxysm only occurs at a time. Sometimes, however, they recur several times—the patient passing from one to another, with but a very short interval between them. In general, the first attacks are shorter than those which occur after the disease has continued for some time. The contrary, however, generally takes place when the first attack is caused by some sudden and violent mental impression, as terror.

With regard to the interval between the epileptic seizures, also, there exists the greatest diversity. In some cases the paroxysm returns almost daily; in others at various intervals, from a few days to a whole year. Many instances observe a more or less perfect periodicity in the recurrence of the fits; whilst others are quite irregular in this respect. Richter observes, that cases arising from gastric or intestinal irritation, and from catamenial irregularities, are most apt to assume a periodical character.§ Occasionally the paroxysms recur regularly at the periods of a new or full moon. Nearly twenty years ago I treated a case successfully, in which for several years previously the paroxysms had returned regularly on the night of each full moon. Examples of this kind may, however, occur as mere coincidences, without any relation, as cause and effect, between the two phenomena.‖

Epilepsy seldom proves fatal, except through the intervention of apoplexy. When it recurs very frequently, however, the mental powers gradually fail, until at last a total imbecility or idiotism is induced. The most complete state of idiotism I have ever seen, was produced in less than two years, in a fine, intelligent boy, by the ferocious attacks of this malady.

Post-mortem appearances.—The morbid appearances discovered on dissecting

* Dr. Burnett relates a singular case of epilepsy, in which the pulse became so slow at times as to beat only fourteen strokes in a minute.—(*Med.-Chir. Transact.*, vol. xiii part i. p. 202.) Morgagni relates two similar cases.

† De Haen, Ratio Medend, tom. v. p. 123.

‡ Voigtel's Handbuch der Patholog. Anatom., b. i. p. 70.

§ Specielle Thérapie, bd. vii. p. 570.

‖ For a full discussion of this point, the reader may consult Mead, de Imperio Solis et Lunæ in Corpus Humanum; also, Balfour on Sol lunar influence. That the moon governs the epileptic paroxysm, appears indeed to be a very ancient opinion. Galen, Aretæus, and Alexander Tralianus entertained this opinion.—(*Cook on Nervous Diseases.*)

subjects who die of epilepsy, are often similar to those which occur in apoplexy and palsy. No man has, perhaps, dissected so great a number of bodies that had died of epilepsy as M. Wentzel. Previous to the dissections of this indefatigable anatomist, it was generally thought that the *cerebrum* is the chief seat of the proximate cause of epilepsy. M. Wentzel, however, in a very great proportion of heads he examined, found the cerebrum perfectly sound, whilst the *cerebellum* was uniformly in a diseased condition.* The part of the cerebrum which he found most frequently affected was the pineal gland. The cerebellum was generally of a dusky red, approaching to a blackish color; in some cases it exhibited a whitish or yellow hue, and in a few instances the posterior lobe was of a gray color. This portion of the encephalon was sometimes very soft; more frequently it presented a preternaturally hard and compact structure. In ten out of twenty-one cases, a morbid, yellow, friable matter was found between the lobes of the cerebellum, which in some instances not only separated the lobes, but caused also the destruction of a portion of their substance. Notwithstanding these observations of Wentzel, dissections made by other pathologists render it certain that the substance of the cerebrum is often materially diseased in epilepsy. This, indeed, Wentzel does not deny, but his observations convinced him that it is much less frequently the case than we might be led to believe from the observations previously published on this subject.† Both Greding‡ and Roederer relate cases in which the cerebrum was disorganized to a greater or less extent. Some French pathologists have pointed out various morbid appearances of the mucous membrane of the intestinal canal as being intimately concerned in the causation of this disease.

Causes.—Observation has informed us that in some cases of this disease the original exciting cause is seated within the head, or acts directly on the cerebral mass; whilst in others the cause is located in some other part of the system, and affects the encephalon secondarily, through the medium of the nerves. It is evident, therefore, that we may with propriety divide this malady into two general varieties—namely, into *idiopathic* and *symptomatic*. Experience has shown that the latter is in general much more apt to yield to remedial treatment than the former.

In some individuals there appears to exist a constitutional predisposition to epilepsy; and it is, without doubt, in some instances, of *hereditary* origin. Boerhaave mentions an instance in which all the children of an epileptic father died of this disease;§ and Stahl has related a similar occurrence.‖ Tissot also mentions a remarkable instance of this kind. An epileptic man had eight sons and three grandsons, all of whom, he says, became affected with this disease. (Cook.)

Children, it has been observed, are much more liable to this disease than adults; but the age at which there appears to exist the strongest predisposition to epilepsy is the period of puberty. Some writers assert that females are more subject to this affection than males; others, however, contradict this assertion. Probably hysteria has been frequently mistaken for epilepsy, which may have

* [Mr. Solly has discovered the connection of fibres between the cerebellum and the anterior fasciculus of the spinal cold, and similar commissures can be traced from the same column to most parts of the cerebrum. The involuntary control of the passions and propensities over the muscular powers can thus be explained, and also the influence of irritation and organic lesions of these fibres in the way of developing the paroxysms of epilepsy. The intellectual powers are supposed to be chiefly affected by derangement of the cineritious or pulpy substance of the brain, while the muscular system is influenced by the medullary fibres which are connected with its spinal apparatus of muscular motion.—Mc.]

† Cook on Nervous Diseases, &c., p. 342.

‡ Sammtliche Med. Schriften, ii. Theil.

§ Prælectiones in Prax. Med., tom. v. p. 30.

‖ De Hereditar. Dispos. ad Varios Affectus. Halle, 1706, p. 48. Also in his Dissertatio de Epilepsia Hæreditaria Casum Exhibens, as quoted in Richter's Specielle Thérapie, bd. vii. p. 594.

given rise to this opinion. Those who have once had this disease, and have been freed from it by remedial treatment, generally retain a particular predisposition to its recurrence.

The *exciting* causes of epilepsy are exceedingly various. Of these causes some act immediately on the brain, and others make their impressions on distant parts, and affect the sensorium commune secondarily through the medium of the nerves. The most common of the former variety of causes are; injuries and malformation of the cranium; exostosis from the internal surface of the bones of the skull; spiculæ of bones driven in upon the brain; preternatural distension of the cerebral vessels; various organic affections of the brain, and effusions of different kinds within the cranium. (Cook.)

Sudden and violent mental emotions frequently produce this disease by a morbid excitement originating in the brain. Fear, terror, grief, and other disagreeable sensorial and mental impressions, have been known to give rise to epilepsy. I have met with three instances that were excited by terror. Locker states that six out of fourteen cases of this disease, which came under his care in the Hospital St. Mark at Vienna, were produced by terror. Many remarkable instances of epilepsy, excited by disagreeable and strong impressions on the senses, have been reported. Strong odors, sudden and vivid light, loud and peculiar sounds, and certain colors, have produced this disease in weak and irritable habits. Weikart relates the case of an individual in whom the smell of red beets excited epileptic paroxysms.* The odor of the garden ranunculus has also given rise to this disease;† and Cook quotes from Buchner an instance of an epileptic child in whom the sight of a vivid red color seldom failed to excite a paroxysm of the disease. Cases of this kind are of course connected with idiosyncrasies by which the influence of these exciting causes is peculiarly favored.

This disease has frequently been excited by the sight of a person affected with the epileptic paroxysm. Dr. Rush mentions several instances of this kind. The principle of association exerts indeed a powerful influence over the actions of the animal economy; and in no disease has this been more strikingly exemplified than in the present one. The mere recollection, or sight of the causes or circumstances which attended the first attack of the disease, has re-excited the paroxysm.‡

Among the causes of this disease that act upon the brain through the general system, *gastric* or *intestinal* irritation is perhaps the most common. Epilepsy from this cause is most frequently met with in children. Worms, and indeed every other substance which is capable of producing an irritation in the nervous extremities of the mucous membrane of the alimentary canal, may give rise to this affection in weak and irritable subjects. A protracted case is related, which ceased entirely after the expulsion of a tape-worm.§ Leeches swallowed into the stomach have produced epilepsy. (Gudenklee.)

The suppression of habitual evacuations, whether sanguineous or serous, is another powerful exciting cause of epilepsy. Suppressed or morbidly postponed catamenial discharge soon after the age of puberty, is particularly apt to give rise to this affection in individuals otherwise predisposed to it.‖ The healing up of old ulcers, setons, issues, &c., may give rise to epilepsy. Richter mentions the suppression of habitual sweating of the feet as a strong exciting cause of this and other convulsive affections. The repulsion or sudden drying up of chronic cutaneous eruptions, particularly the itch and *tinea capitis*, also may produce epilepsy; and in the exanthemata, either just before the eruption is about coming

* Hufeland's Journal, bd. xii. st. i. s. 174.

† Acta. Natur Curios., Dec. iii. Ann. ix. x. Obs. 92, p. 170.

‡ Van Swieten, Commentar, tom. iii. p. 414.

§ Mursinna's Journal f. Chirurg. Arzneik. u. Gebershuife, b. i. st. ii. p. 306. (Richter.)

‖ Falk, Dissert. de Epilepsia, s. Motib. Convuls. Virgin. See also the interesting observations of Prichard on this subject in his Treatise on Nervous Diseases.

out, or from its sudden retrocession, this form of convulsive disease is by no means uncommon.

Excessive evacuations are also among the exciting causes of epilepsy; and this is particularly the case with inordinate seminal evacuations, either from excessive venery or masturbation.*

Various poisons, more especially of the narcotic kind, sometimes produce this disease. It is said that in Kamschatka, epilepsy is frequently occasioned by the use of an indigenous species of toad-stool, which the inhabitants of that country are much in the habit of eating on account of its exhilarating effects.† The abuse of opium in children has a tendency to produce this malady; and among the mineral poisons, lead and arsenic are said to be most apt to excite it. Wendt mentions a case produced by lead, and Dr. Warren relates a fatal case produced by this poison. (Cook.) In the second volume of the Medico-Chirurgical Transactions, five cases are reported which arose from the reception of arsenic into the stomach.

The habitual intemperate use of alcoholic liquors is a very common cause of epilepsy. It is probable that epilepsy from this cause proceeds from the combined influence of hepatic disorder, and a constant preternatural determination of blood to the brain. Painful dentition, pregnancy, and parturition occasionally excite the disease. Tissot relates three cases which arose evidently from pregnancy. In one case, the patient was affected with epileptic paroxysms almost every week, in three of her pregnancies, until quickening commenced. Irritation from biliary concretions, as well as from urinary calculi, has sometimes given rise to this affection. Dr. Cook refers to the works of Bertholini for examples of this kind.

Habitual tendency to congestion or plethora of the vessels of the brain is perhaps one of the most frequent exciting causes of the epileptic paroxysm. This may be the result either of a constitutional habit, or of the operation of some one of the foregoing exciting causes, particularly intestinal irritation, and suppressed sanguineous and serous discharges.‡ Atmospheric influences also have been supposed capable of exciting this disease. Great heat or cold, and sudden vicissitudes of temperature, are mentioned as *exciting* causes; but their influence in the production of this affection is perhaps rather *predisposing* and *exciting*.

On the subject of *the proximate cause* of epilepsy, a very great diversity of opinion has been expressed. Without entering into a detail of these opinions, all of which are hypothetical, and many of them absurd, I shall content myself with a statement of those circumstances which experience and observation appear to sanction in relation to the pathology of this affection.§

1. The immediate cause of the epileptic paroxysm, whatever its essential chaacter may be, is always seated in the *brain*.

2. In the majority of fatal cases, organic and other obvious affections of the brain, particularly of the cerebellum, or of the meninges, are found on dissection, and which, we may infer, contributed to the excitation of the epileptic paroxysms.

3. The cerebral affection is in some instances primary, and the result of causes that act directly upon the brain. In others, probably in the majority of cases, it is secondary, depending on primary irritations located remotely from the brain.

4. Immediately before the accession of the epileptic attack, it would seem that vascular turgescence takes place in the encephalon; and the pressure thus created, in co-operation with the general predisposition to the disease and the

* Zimmerman on Experience, vol. iv. chap. 10.

† Langsdarf in d. Weterauschen Annalen, bd. ii. hft. 2, (Richter, Spec. Thér.)

‡ [The inhalation of the vapor of sulphuric ether to produce the effects of nitrous oxide, has produced the worst form of congestive epilepsy I have ever seen.—Mc.]

§ Mr. Mansford, in a work published on epilepsy a few years ago, gives it as his opinion, that the proximate cause of this disease consists in an accumulation of the electric matter in the brain, or what he considers the same thing, a superabundance of the nervous power in the sensorium commune.

organic cerebral affection, where such disorder exists, is probably the immediate exciting cause of the paroxysm.

It would be useless to enter into any discussion concerning the causes of the paroxysmal character of this affection, or of the occasional strict periodicity of its recurrence. The influence of habit has been adduced in explanation of these mysterious points of pathology. The term *habit*, however, in a physiological sense, can mean nothing else than a tendency to repeat an action, whether morbid or healthy, that has been produced by some exciting cause, without the presence or further co-operation of such cause. This, however, is merely expressing the general fact, and offers no explanation of it whatever.

Diagnosis.—The affection with which epilepsy is most liable to be confounded, is hysteria, when this disease assumes the convulsive form. They may be distinguished from each other, however, by the following circumstances. In hysteric convulsions, the countenance is less livid and distorted than in epilepsy; and there is seldom any foaming at the mouth, or profuse discharge of saliva, nor does it terminate in heavy sleep, or in a confused and torpid state of the mind, so general at the conclusion of the epileptic paroxysm. In hysteria, too, there are always some concomitant phenomena which indicate its character, such as the globus hystericus, involuntary laughing or weeping, and in many instances a continuation of some degree of consciousness, &c.

Prognosis.—Although the immediate danger of the epileptic paroxysm is not in general very great, yet in relation to its sanability, the prognosis is always highly unfavorable. Even where a cure or suspension of the disease has been effected, the liability to a relapse is always considerable. When epilepsy depends on organic disorder within the head, no remedial management can effect a cure. Epilepsy, however, unconnected with cerebral lesion, may sometimes be cured.* That variety of the disease which occurs in young females about the age of puberty, from menstrual irregularities, is not unfrequently curable, and indeed sometimes passes off spontaneously after the catamenia begin to flow regularly. The longer the disease has continued, or rather, the more frequently its attacks have been repeated, the greater will be the difficulty, in general, of effecting a cure; and when the mind has once become obviously affected or impaired by its attacks, all hopes of a cure may be abandoned. Experience, too, has shown that those epilepsies which commence soon after birth, or during early infancy, rarely, if ever, yield to remedial treatment. From the period of dentition to that of puberty, is the most favorable age for the cure of this affection. Hippocrates observes, that those who are attacked with epilepsy after the twenty-fifth year of age, will continue to have it as long they live—an observation which, though very generally correct, is not confirmed by the experience of subsequent practitioners.† When the disease is the consequence of excessive venereal indulgence or masturbation, it may sometimes be removed, provided the mental powers have not as yet suffered considerably from its repeated attacks, or from the influence of its cause. The epileptic paroxysms which sometimes

* Dr. Dewees, in his work on the "Practice of Physic," has inadvertently expressed contradictory sentiments in relation to the curableness of this disease. Under the head of treatment, he asks, "What plan of treatment has ever succeeded in curing epilepsy? Has epilepsy ever been cured?" Under the head of diagnosis, however, he says, "When the disease is symptomatic, it is occasionally curable:" again, "those attacked between the fourth and tenth year may be cured by proper treatment." Most assuredly this latter sentiment accords with the experience of the ablest of the profession of all ages. However appalling and really intractable this disease may in general be, perfect cures are by no means so uncommon as the doctor's interrogatories might lead one to suspect. I have known at least five distinctly marked cases cured under my own observation, two of which were of more than two years standing, and one above six years.

† He says, moreover, that when epilepsy commences before the fourteenth year, and is not connected with an hereditary predisposition to the disease, it frequently terminates spontaneously in after-life.—Aphor. xv. s. 7.—Aphor. vii. s. 5.—Aphor. xlv. s. 2.

occur in the exanthematous diseases, are seldom followed by serious consequences, and very rarely occur afterwards.

When the premonitory symptoms consist of some affections in the head, it may be regarded as more unfavorable than if they manifest themselves in remote parts of the body, particularly in the extremities. Richter observes, that a long continuance of the sleep, and subsequent mental stupor and confusion after the subsidence of the paroxysm, are very unfavorable signs.

Epilepsy from moral causes, particularly from violent anger or grief, is said to be very rarely cured. (Jahn, *Klinik. d. Chronisch. Krankh.*, bd. i. p. 276.) It is also asserted, that those cases which come on at night during sleep, are in general more intractable than such as occur during the day, and are preceded by premonitory symptoms. (Richter.) It has been affirmed by men of great experience, that epilepsy occasionally ceases spontaneously on a change of climate.*

Treatment.—There is, perhaps, no disease in which medical treatment is so frequently purely empirical as the one now under consideration. The causes are so multifarious, and generally so obscure, or so wholly beyond our cognizance, that we are seldom enabled to prescribe with any degree of reliance upon general and rational therapeutic principles. In this state of perplexity and uncertainty, we have often no other alternative left us, than to administer remedies, without being able to give any other reason for their use than that they have been occasionally successfully employed. True as this observation unquestionably is, we have nevertheless, in some instances at least, sufficient lights in the symptoms and causes to lead us to a consistent and rational plan of treatment. When called to a case of epilepsy, the first object of the practitioner should be to inquire into the nature of its exciting cause, its duration, the time and manner of the first attack, the general constitutional habit of the patient, his age, previous or concomitant diseases, his habitual temper and disposition of mind, his manner of living, his probable hereditary predisposition—in short, into everything which can throw light on the particular character of the disease, and on the constitutional or acquired habits of the patient.

Authors assert, that when the premonitory sensation, termed *aura*, commences in one of the lower extremities, the epileptic paroxysm may sometimes be effectually prevented, when it is approaching, by compressing the limb firmly with a tourniquet or ligature above the part at which the aura may have reached. Dr. Cullen observes, "that a ligature upon the limb above the part from which the aura arises, should always in those cases be applied, both because the prevention of a fit breaks the habit of the disease, and because the frequent compression renders the nerves less fit to propagate the aura."† Dr. Cook mentions an instance from the London Medical and Physical Journal, in which pressure made in this way prevented the paroxysm. Richter states, that when compression is thus made on a limb, above the ascending aura, the patient generally experiences great anxiety of feeling in the præcordia, with extremely painful twitches in the compressed limb, accompanied sometimes with a sensation as if a heavy stone were thrown upon it. Brechstedt and Michaelis assert that the application of the tourniquet upon a leg has been known to put a speedy stop to the epileptic paroxysm after it had actually supervened.‡ In persons of robust and plethoric habits, prompt and efficient bleeding on the occurrence of the premonitory symptoms, has been known to keep off the epileptic attack. Active purgatives have also been recommended with the view of obviating or palliating the impend-

* Lentin, in Hufeland's Journal, bd. xiv. s. iii. p. 17.

† [The late Mr. Loper, prompter of the Chestnut Street Theatre, could always prevent a monthly paroxysm of epilepsy by applying a tourniquet to his left thigh the instant he felt the *aura* creeping up from his left ring toe. On one occasion, however, he was prevented by the exigencies of his calling from applying this prophylactic, and the attack which followed proved fatal.—Mc]

‡ De artum ligaturis ad nonnullos morbos internos. Michaelis—in Medizin. Pract. Bibliothek, bd. i. st. iii. p. 397—as quoted by Richter.

ing paroxysm, where the premonitory stage is protracted; but their tendency in this respect deserves little or no attention. Richter and other of the earlier German writers speak favorably of the employment of *emetics* with this intention. They cannot, however, be used without considerable risk in cases attended with strong congestion in the vessels of the head. Richter states that they are only adapted to those cases which continue to recur from habit, after the original exciting cause has ceased to act. It even appears from the observations of this writer, that a radical cure may be effected in this way. He states that he cured a woman of this disease, by frequently suspending the paroxysms by the administration of emetics a short time before the expected occurrence of the epileptic attack.* It must be observed, however, that many highly respectable authorities might be adduced against the use of emetics in this affection; and as a general rule, they are indeed to be regarded as of very doubtful propriety. Jahn, in his excellent work on chronic diseases, says that a draught of cold water will occasionally do more towards keeping off an impending attack of epilepsy than any other means; and Dr. Busmann has published some cases tending to confirm this observation.† Some fifteen years ago, while practising in Lancaster, I knew an old epileptic patient who could generally keep off the paroxysm for some months by taking a large draught of cold water as soon as the premonitory symptoms came on. Without this precaution he seldom escaped having one or two fits a week.

In the epileptic paroxysm, our principal object should be to diminish the preternatural congestion of the cerebral vessels. The immediate danger of an epileptic fit arises chiefly from this condition of the cephalic circulation; for when death occurs during the paroxysm of this disease, it is almost invariably by apoplexy, from vascular turgescence, or sanguineous extravasation. When the patient is plethoric, and the signs of inordinate sanguineous congestion in the head are considerable, it will be prudent to abstract blood, and to remove everything that may compress the veins of the neck, or impede the free return of blood from the brain to the heart. It is very doubtful, however, whether any treatment, during the epileptic paroxysm, can materially mitigate its violence, or shorten its duration. It is almost exclusively with the view of protecting the brain, that remedial measures can be resorted to during the fit with a prospect of advantage.

The most important part of the treatment of epilepsy, however, is that which is proper during the intervals of the paroxysms, for the purpose of effecting a permanent removal of the disease.

I have already adverted to the importance of attending to the nature of the exciting cause in instituting a course of treatment for its radical cure. If our inquiries in this respect are successful, it will not be difficult to lay down an appropriate plan of treatment. Thus, if, on a careful examination, it appears that the bowels are in a loaded and irritated state, and particularly if signs of intestinal irritation existed, in a very obvious manner, previous to the occurrence of the disease, it would be exceedingly unwise to neglect the state of the bowels, and to resort at once to some one of the numberless remedies usually recommended in the disease. Epilepsy from this cause is principally confined to infancy and childhood. It is in this variety of the disease that emetics have most frequently been found useful. When symptoms of gastric irritation—such as nausea, flatulency, disturbed sleep, and other manifestations of indigestion are present in children affected with this disease, a course of emetics has been used with decided success. (Richter.) In a child which had been affected with occasional epileptic paroxysms for upwards of eighteen months, I succeeded in removing the disease entirely by a course of emetics (ipecac.) administered every third day.‡ Dr. Clark recommends a solution of sulphate of zinc, in an aqueous infusion of ipecacuanha, to be given every six, eight, or ten days.

* Specielle Thérapie, bd. vii. p. 630. † Hufeland's Journal, bd. x. st. ii. p. 133.

‡ This case came on after an attack of ague, which was cured by Fowler's solution.

Absorbents have also been recommended in the epilepsies of infants, attended with gastric disturbance; and when used in conjunction with mild tonics, and an occasional aperient, they are sometimes beneficial, particularly where there is much acidity in the primæ viæ.*

Richter observes, that we have reason to presume that the remote cause of the disease is seated in the stomach when vomiting occurs at the close of the paroxysm. He mentions also a peculiar tremulous motion of the under lip, as a sign of gastric irritation, from vitiated secretions or other offensive matters. Van Swieten relates a case of epilepsy, the fits of which were always preceded by a remarkable tremor of the under lip. The case was treated by emetics and purgatives, and thereby permanently removed.† If symptoms of intestinal worms are present, anthelmintic remedies are decidedly indicated. Small and repeated doses of calomel, with an occasional dose of castor oil in union with a small portion of spirits of turpentine; or infusion of spigelia, followed with a full dose of calomel and jalap, will sometimes answer in such cases.

In verminous epilepsy, full doses of powdered valerian with the elutriated oxyde of tin, have been successfully used. From one to two drachms of the former, with thirty to forty grains of the latter, may be taken three times daily.

Should it appear that the disease arose, in the first instance, from sudden suppression of the perspiration, a course of diaphoretics, and whatever else may have a tendency to keep up a regular action of the cutaneous exhalents, should be resorted to. Frictions with dry flannel; the occasional use of the warm bath, rendered more stimulating by the addition of common salt; flannel worn next the skin; active exercise when the weather is dry; the internal use of diaphoretic remedies—such as the pulvis antimonialis; camphor in union with tartar emetic; the tincture of guaiacum; and sulphur, are appropriate and occasionally beneficial remedies in such cases.

When epilepsy arises from the repulsion of cutaneous eruptions, or the drying up of old ulcers, the manifest indication is to restore these affections; or, if this cannot be done, to establish others artificially in their stead. For this purpose we may employ issues, setons, blisters, and particularly frictions with tartar emetic ointment, together with diaphoretics, warm bathing, and stimulating frictions. Richter says, that in such cases, vomits are occasionally very useful; he also speaks favorably of the use of musk and camphor in epilepsy arising from causes of this kind. Prichard recommends mercury, given to the extent of producing ptyalism, in this variety of the disease. One of his patients was perfectly cured by a copious salivation.

In those cases which occur in young females, in consequence of an unsuccessful or imperfect menstrual effort, the indications are, to remove the preternatural determination to the head, and to establish or restore the natural determination to the uterine system, and thereby promote the regular performance of the menstrual function. This variety of the disease occurs chiefly in young females of sanguine temperament; and bleeding, therefore, can seldom be dispensed with. Indeed, in all cases of this kind I have met with, bleeding was decidedly indicated by the condition of the pulse, the occasionally flushed countenance, and sense of fullness in the head. Dr. Prichard, speaking of this variety of the disease, which he calls *uterine*, observes—"The immediate effects of blood-letting are, generally, relief of the pain and oppression of the head, and a subsidence of the carotid and temporal pulsations. Sometimes the use of the lancet is speedily followed by a restoration of the catamenia." He advises that the blood be taken while the patient is sitting up, and that it be suffered to flow until syncope begins

* The famous powder of Margrave, which is still a good deal used by some of the German practitioners in infantile epilepsy, owes whatever powers it possesses to its absorbent, tonic, and aperient virtues. It is composed of one ounce of powdered mistletoe, the same quantity of sugar, and half an ounce of the carbonate of magnesia The dose is a teaspoonful two or three times daily for a child under five years old.—*Richter's Spec. Thérap*, bd. vii. p. 645.

† Comment., t. iii. p. 439.

to come on. In addition to bleeding in cases of this kind, the warm semicupium is a valuable remedy.* We may also employ frictions about the loins, back, and pubic region, and stimulating enemata, with advantage. Prichard recommends clysters composed of spirits of turpentine and castor oil, in such cases. An ounce of each may be occasionally thrown into the rectum. After the plethoric or phlogistic state of the system has been reduced by the foregoing measures, it will be proper to resort to emmenagogue remedies, if the menstrual evacuation has not already been restored. The following pill may be employed for this purpose.† According to the experience of Dr. Prichard, the best emmenagogue we possess in *uterine epilepsy* is the *oil of turpentine*. It should be given in doses of from a half to two drachms once or twice daily. I used the turpentine in a case, about eighteen months ago, with complete success. Setons in the nape of the neck, or on the arms, or on the sacrum, have also been recommended. This variety of epilepsy is almost invariably suspended by pregnancy.

In epilepsy from onanism, besides the proper moral influences, Richter strongly recommends the use of camphor in regular and full doses. That this article possesses the power of lessening the venereal propensity I am fully persuaded, and its general influence, independent of this particular effect, renders it a suitable remedy in cases of this kind. Patients affected with epilepsy from this cause, should sleep on a hard matress, rise early, take exercise in the open air, and use a mild and unirritating diet. The tepid shower-bath, and laborious occupations, will sometimes assist materially in removing the habit upon which the disease depends, and without the discontinuance of this habit, nothing useful can be expected from remedial treatment.‡

Epilepsy from local injuries of the head has been cured by surgical operations. Boerhaave, Thenier, Stalpart, and Van der Weil, relate instances in which trepanning succeeded in removing the disease. *Tissot* also mentions several instances of this kind. Dr. Massie gives an account of a case of epilepsy which was produced by a blow on the head, and consequent depression of a portion of the cranial bones. After the disease had continued about four years, the patient was trepanned, and a spicula of the bone removed, after which the paroxysms returned no more.§

Instances have also occurred in which epilepsy was cured by surgical operations on other parts of the body than the head. Portal relates a case where the paroxysms always commenced with violent pain in the index finger. This patient was cured by dividing the radial nerves.‖ The disease has sometimes terminated spontaneously after the removal of spiculæ of bones, balls, tumors, or other foreign bodies pressing upon particular nerves.¶ Dr. Dudley, of Lexington, succeeded in curing a case of epilepsy by removing a spicula of bone which had penetrated the substance of the brain to a considerable distance. Dr. Rogers, of New York, succeeded in a case by a similar operation; and an instance is related by Dr. Guild, of Alabama, which was cured by the operation of trephining.**

* The bath, says Prichard, should be about the temperature of 95° or 98° of Fahrenheit's scale.—*Treatise on Diseases of the Nervous System.* Lond. 1822.

† ℞.—Extract. sabinæ ʒii.
G. aloes lacc. ℈i.
Sulphat. ferri grs. x.—M. Fiant pil. No. 40. Take one every six hours.

‡ [In this class of cases, the application of solid nitrate of silver to the prostatic portion of the urethra is especially serviceable.—Mc.]

§ Philadelphia Med. and Phys. Journ., 1809, No. 35.

‖ Cours d'Anatomie Médicale, t. iv. pp. 247, 272.

¶ Memoires sur la Nature et le Traitement de Plusieurs Maladies. Par Ant. Portal, vol. xi. p. 229. (Richter)

** [I applied the trephine in one case, over the seat of an old injury of the skull, and extracted fragments of the internal table which had been driven inwards through the dura mater, so as to penetrate the cerebral substance. But a great deal of grisly induration existed around and below these fragments, so that, although the patient recovered from the operation, subsequent

This case is an extremely interesting one, and deserves to be consulted as a remarkable instance of successful trephining for this disease.*

Where we can ascertain the remote cause of the disease, we should always found the plan of treatment on the general indications which such a knowledge is capable of affording. In the majority of instances, however, we are wholly left in the dark with regard to this point, and very frequently indeed, all our efforts to cure the disease, under the guidance of what we may deem the most unequivocal curative indications, are unsuccessful. In this case we are obliged, if we wish to pursue our endeavors to effect a cure, to resort to one, or many, by turns, of that long list of remedies which, according to the reports of eminent practitioners, or our own experience, have occasionally succeeded in removing the disease, without our being able to give any other satisfactory reason why they are resorted to. The following are the most celebrated of these anti-epileptic remedies.

Valerian.—This is one of the most ancient remedies employed in this disease. Aretæus and Dioscorides recommend it as a valuable medicine in this affection; and it is favorably mentioned by many of the most celebrated of modern writers.† It should be given in as large doses as the stomach will bear. From one to two drachms may be taken three times daily. This article is said to be most apt to do good in epilepsies from verminous irritation, suppressed catamenia, terror, and repelled cutaneous eruptions. Quarin used it with success in epilepsy of infants. (Richter.)‡ Biett generally employs the oil of valerian in this affection in doses of from 40 to 50 drops three times daily. (Casper. *Charakter. d. Fanz. Med.*, p. 192.)

The *mistletoe* also is a very old remedy in epilepsy; and if we are to place

paroxysms of epilepsy were not prevented. He was relieved in some measure, however, from the violent spasms of the opposite side, with which he had been occasionally afflicted for several months before. From the experience of surgeons within my course of observation, I have not been able to form a favorable opinion of the operation of trephining, in cases of epilepsy following injuries.

The operation of securing the common carotid artery has been recommended on the principle of diminishing the flow of blood through the brain in severe cases of epilepsy. Dr. M'Gill, of Hagerstown, is said to have performed this operation repeatedly, and in one case upon both the common carotids at two successive operations on the same subject. Whether his success was permanent or merely temporary, I have had no opportunity of ascertaining. In a case of violent epilepsy, connected with the protrusion of a pulsating vascular tumor (aneurism by anastomosis) through the parietal bone, I took up the common carotid. The result was that the tumor shriveled away, and the epileptic paroxysms disappeared for about six months, when they reappeared with diminished violence

The division of the sensitive nerves, which supply painful spots on the scalp, sometimes affords relief. I cured a young engineer of a bad epilepsy which had followed a blow on the upper region of the right side of the os frontis, received in the famous Bristol riot some three years before. A hard cicatrix remained over the principal branch of the frontal nerve, and pressure upon it would at any time excite a paroxysm. I cut out the cicatrix, and a portion of the nerve with it, and the disease never recurred.—Mc.]

* American Journal of Medical Science. October 1829.

† Hoffman, De Haen, Burserius, Haller, Murray, Selle, Tissot, Thilenius, Vogel, Hanneman, Horn, Quarin, and others, recommend it as a valuable remedy in epilepsy. On the other hand, Cullen, Home, Heberden, and Woodville, regard it as of but little value in this disease.

‡ The famous *anti epileptic powder of Ragolai* contains a large proportion of valerian. According to Knopf's analysis, this nostrum is composed of one drachm of valerian, one scruple of orange leaves, two grains of muriate of ammonia, and a few drops of cajeput oil. Jahn thinks that it contains a portion of the powdered root of the *convallaria majalis;* and some assert that it consists of a mixture of valerian, agaric, and an ethereal oil. This remedy, according to the testimony of Richter and others, has cured obstinate and even inveterate cases of epilepsy. Richter succeeded in curing a case of four years standing, by a powder composed of one drachm of valerian, with three drops of cajeput oil, taken four times daily for six weeks. (Thérap. Spec., vol. ii. p. 672.) In this city the following composition has been used with complete success in some instances, and frequently with the effect of postponing the paroxysm for many months:

℞.—Pulv. zingiberis.

—— fol. salviæ.

—— sem. sinapi, āā ℥i.—Dose—a teaspoonful three times daily. I have myself employed this powder with advantage in a few cases, though never with complete success.

any reliance on the testimony of Boerhaave, De Haen, Van Swieten, Hufeland, Stark, and Richter, we cannot doubt of its having proved effectual in removing this affection. Cullen admits that in large doses it may perhaps be useful; but he thinks it probable, and with justice, that the reputation it once had arose in a great measure from its having been an object of superstition, and thus calling in the powerful aid of the imagination to whatever powers it may really possess of itself. Frazer, in a small work published on the powers of this article, asserts that he cured nine cases out of eleven with this medicine. He gave it in powder, in doses of from two scruples to two drachms, twice daily in a draught of camphorated emulsion. (Cook.) We have, moreover, the testimony of Fothergill and Dr. Willan, in favor of this article as a remedy in epilepsy. Of late years, however, it has fallen into total neglect. I knew an empiric who succeeded in curing several old cases with this article.

The *animal oil of Dippel** also was formerly a good deal employed in the treatment of this disease; and we have the testimony of Hoffman, Cullen, Bang,‡ Kortrum, Quarin, Werlhof, Thouvenel, Van Hoven, and others in its favor. It is given in doses of from 20 to 50 drops three times daily. It is said by Richter to be most useful in epilepsies originating from metastatic gout, rheumatism, and from repelled cutaneous eruptions.

The *oil of turpentine* has at present no inconsiderable reputation as a remedy in this disease. I have already mentioned its usefulness in epilepsy from menstrual disorder, on the authority of Dr. Prichard. It has also been successfully used in other varieties, particularly in cases depending on intestinal irritation from worms and other offensive matters. Dr. Latham cured several cases of epilepsy with this remedy. Dr. Young has given an account of two cases which yielded under the use of this remedy ;‡ and Dr. E. Percival relates three instances of its successful employment.§ Dr. W. Money also testifies to the usefulness of this article in epilepsy; and Dr. Prichard assures us that of all other remedies which he has tried in this disease, he has found none so frequently useful as the oil of turpentine. (*Loc. cit.*) Biett is said to employ this oil frequently for the cure of epilepsy in the Hospital St. Louis. This article should be given in doses varying from a half to two drachms three times daily. Fresh milk is perhaps the best vehicle for administering it.

The *root of the pæony* was anciently highly esteemed for its powers in this disease. It was a favorite remedy with Stark; and it is particularly recommended by Hufeland, Jahn,‖ and Thom. Hufeland says, it is especially useful in the epileptic affections of children. The powder is given in doses of half a drachm three times daily, or an infusion of one ounce of the root to eight ounces of water given in tablespoonful doses every two hours.

Agaricus muscarius was first employed in this disease by Bernhard. Wistling and Gruner afterwards published statements illustrative of its powers in this affection. (Richter.) It is said to be most useful in cases originating from repelled cutaneous eruptions. The dose is from a scruple to a drachm three times daily.

Artemisia vulgaris, or mugwort, has been lately much commended for its virtues in this disease by several eminent German practitioners. About eight years ago, Dr. Burdach, an eminent physician and writer, published an account of the successful treatment of several cases of epilepsy by this root; and in a recent number of *Hufeland's Journal*, he has adduced further evidence of its usefulness in this disease. It is a remarkable circumstance, he says, that in nearly every case in which this article proved successful, an evident amendment of the disease took place from the first dose. It appears further, from the expe-

* Dippel, Disquisitio de Vitæ Animalis Morbis, p. 89.
† Acta. Societ. Med. Hav., vol. i. p. 500.
‡ Transactions of the College of Physicians, Lond., vol. v.
§ Edinb. Med. and Surg. Journ., vol. ix. p. 271.
‖ Klinik. d. Chron. Krankh., bd. i. p. 282.

rience of this physician, that in cases of epilepsy occurring in *male* subjects about the age of puberty, this remedy very seldom does any good. In young females about the same age, "its beneficial effects are often prompt and decisive." He occasionally found it very speedily successful in apparently very obstinate cases, while in others, seemingly quite similar, it was wholly inefficient. An interesting instance of the successful employment of this remedy is related by Dr. Wagner, in *Hufeland's Journal*, (vol. for 1824.) And in the twelfth *Annual Report of the Berlin Polyclinic Institute*, there is another case related which yielded under the use of the artemisia. It is usually given according to the following formula.* This is not a new remedy. Ettmuller mentions its use in epilepsy; and Zwinger, speaking of this plant, says, *mire in epilepsia valet*. The internal ligenous part of the root is inert. The cortical portion alone is said to possess medicinal powers. The artemisia is indigenous to this country, particularly to Pennsylvania.†

Of the narcotics, belladonna,‡ opium,§ camphor,‖ and stramonium,¶ have been most recommended in this affection. Some of the antispasmodics also have been employed with benefit in epilepsy. Among these, musk, castor, assafœtida, are generally supposed to be the most useful. Very commonly, however, no advantage whatever is to be derived from remedies of this kind; and they are often manifestly injurious, by their tendency of increasing preternatural determination to the head.

Of late years *phosphorus* has been strongly recommended by some as a remedy in this affection. I gave it in one case about two years ago, and although it did not perform a cure, it suspended the paroxysm above three months beyond its usual period of recurrence. Four grains may be dissolved in half an ounce of sulphuric ether. Of this, from eight to ten drops should be given three times daily in some mucilaginous fluid.** This article cannot, however, be employed with propriety in cases attended with general plethora, or habitual congestions in the cephalic vessels. Where symptomatic epilepsy is

* R.—Pulv. rad. artem. vulg. ℥ss.
—— sacch. albi ʒi.—M. Of this, about a teaspoonful is to be taken four times daily, the dose being gradually increased.

† Besides the foregoing remedies, a great many others of a similar character have been recommended in this affection. *Veratrum Album* (Stark, Shulze, Greding). The roots of the *white lily* (Hufeland's Journal, b. xxxi. p. 30), *Phelandrium aquaticum*; faba St. Ignatii; the fresh *juice of white onions* (Hufeland's Annalen); *Radix meu* (Jahn); the *juice of unripe grapes* (L. Frank, Loebstein-Loebel); *sedum acre* (Zachorn, Hufeland's Journ., bd. xl. p. 19); *folio aurantiorum* (Van Swieten, De Haen, Stoerk, Werlhof, Stark, Hufeland, Thilenius). The *carbonate of potash* in large doses, is recommended in recent cases. (Hufeland's Journ., bd. viii. p. 170.)

‡ Stoll (Ratio Medend., vol. iii. p. 406), Hufeland (Journal d. Prack. Heilk., bd. ix.), Greding (Vermischte Schriften), and Jahn (Klinik. d. Chron. Krank., b. i. p. 282), speak favorably of this narcotic as a remedy in epilepsy. Richter says, it should never be given to children—or in cases attended with habitual congestion of the cerebral vessels.

‡ Tralles (Usu Opii Salubris et Noxius, &c., p. 16.) Fothergill (Med. Observ. and Inquir., vol. vi. p. 80) asserts that opium may be very beneficially used in cases attended with a weak, irritable, and nervous habit of body; and in cases that arise from violent pain or mental excitement. Dr. Huxy relates an instance of the successful employment of opium in epilepsy; and Dr. Darwin tells us that in two cases in which the fit always occurred at night during sleep, a grain of opium given at bed-time removed the disease completely.

‖ Richter says, that camphor is sometimes particularly useful in cases that depend on onanism, or on the repulsion of chronic cutaneous eruptions. (Loc. cit., b. vii. p. 682.)

¶ This article is much praised as a remedy for epilepsy by some of the Swedish writers. Ohdelius speaks favorably of it; and Greding cured a few cases with its use. Hufeland asserts that he has used the tinct. sem. stramon. with decided benefit in this disease. (Journal, bd. ix. st. 3.)

** In Horn's Archives of Medicine (bd. x. hft. ii. p. 270), the following formula is given for the administration of this article:

℞.—Ol. tereb. ℥ss; Ol. olivar. ʒiii; Phosphor. gr. ii; put them into a half ounce phial, and digest it in warm water until the phosphorus is dissolved; then add mucilage of gum Arabic ℥iv; syrup of cinnamon ℥ss.—M. Dose, a dessertspoonful every three or four hours. (Richter, loc. cit.)

connected with torpor of the vascular and nervous systems, or general debility and relaxation, advantage may be expected from it. Loebstein-Loebel, Van Hoven, and Horn relate instances of its successful employment.

The *oxyde of zinc* is generally regarded as one of our most efficient remedies in epilepsy; and from the testimony extant in relation to its powers, as well as from facts which have come under my own notice, I am inclined to regard it as a medicine of considerable value in this affection.* This article is generally given in much too small doses to do any good in epilepsy. It may be commenced with in doses of three grains thrice daily, and gradually increased to the amount of forty or fifty grains a day. Dr. Guthrie cured a case in which the paroxysms returned three or four times daily, with this article, given to the extent of eight grains on the first day, and gradually increased to forty grains in twenty-four hours. (*Duncan's Annals of Med.*, vol. iv. p. 473.) It is generally given by itself; but it would seem that its powers may at times be enhanced by combining it with bitter and laxative remedies. Lentin (*Hufeland's Journ.*, bd. xiv. st. iii. p. 13) cured an inveterate case with a powder composed of fifteen grains of magnesia, from two to eight grains of oxyde of zinc, two grains of the extract of quassia, and two drops of cajeput oil, twice daily. Stroubel (*Hufeland's Journ.*, bd. 52, st. i. p. 40) used this metallic preparation, in union with mistletoe, with complete success, in a case attended with much nervous irritability.

The *sulphate of zinc* has also been occasionally used with success in this affection. It is favorably mentioned in this respect by Lettsom, Weikart, Collen, Ideler. (*Hufeland's Journ.*, bd. iv. p. 114.)

Cuprum ammoniacum. This was the favorite remedy in epilepsy with Cullen. I have given it in ten or twelve cases, one of which only derived any decided benefit from its use. This article is indeed a very old remedy in this affection. Aretæus mentions it as a valuable anti-epileptic. Richter observes, that the *cuprum ammoniacum* is only calculated to do good in cases attended with a torpid, unirritable, and phlegmatic constitution, and a healthy state of the digestive functions, and when it is continued from habit.† According to Stark, it is especially beneficial in cases depending on verminous irritation, or on repelled herpetic eruptions. Haase, an eminent German writer, asserts that it is much better adapted to the cure of epilepsy in adults than in children; and he agrees with Richter in regarding unirritable and phlegmatic subjects as most apt to derive benefit from its use. The dose at first is from a quarter to half a grain, and gradually increased to one or one and a half grains three times daily, or until it creates considerable nausea and gastric disturbance. Dippel refers to a preparation of copper, consisting of a union of this metal with potash, ammonia, and oil of turpentine, which, he avers, has been used with the most decided benefit in epilepsy. (Richter, *Specielle Thérapie*, bd. vii. p. 701.) The mode of preparing this mixture is given by Durr, (in *Hufeland's Journal*, bd. xxviii. st. iv. p. 117.) Richter says, that when given in union with valerian, its effects are generally more beneficial.

* This remedy has been used with success by *Bell and Percival*, (Edinb. Med. Comment., v. i. p. 229, and v. ii. p. 316;) *Beiries*, *Home*, (Clinical Experiments, p. 223; *Ranoe*, (Acta Societ. Med. Hafn., vol. i. pp. 451, 457;) *Metzcher*, (Adversar. Med., v. ii. p. 98;) *Osiander*, (Denkwairdigk., bd. ii. p. 188;) *Hirschel*, *Richter*, (Med. Chir. Nebenst., pp. 161, 190;) *Shearman*, (Lond. Med. and Phys. Repos., Sept. 1822;) *P. Frank*, (Prax. Med. Univ. Praec., ii. tom. i. p. 409;) *Dr. Haygarth*, *Dr. White*, (Cook on Nervous Diseases, p. 398;) *Van Hoven*, (Handbuch, bd. ii. p. 131.)

† Numerous authorities may be quoted in favor of the anti-epileptic powers of this preparation. The most celebrated are, *Burserius*, (Instit. Pract., vol. iii. p. 11, § 289;) *Loebstein-Loebel*, (Wesen. u. Heilung d. Epilepsie, p. 234;) *Duncan*, *Harles*, (Journ. d. Auslaend Med. Liter., bd. iv. st. 2;) *Bland*, (Medical Commentaries, vol. vii. p. 300;) *Greding*, (Vermischte Schriften, bd. i. p. 103; *Michaelis*, (Med. Pr. Bibl., 1785, b. i. st. 3;) *Stark*, (Handbuch Z. Erkennt, &c.:) *J. Frank*, (Praxeos Med. Univ. Praec., p. ii. vol. i. p. 412;) *Haase*, (Chron. Krankh., bd. ii. s. 103;) *Thilenius*, (Med. u. Chir. Bemerk., bd. i. p. 103;) *Bally*, (Duncan, Medical Annals, vol. i. Lust., p. 337.)

The *nitrate of silver* possesses at present more reputation as a remedy in epilepsy than perhaps any other remedial article. It would be an easy matter to collect a very considerable number of instances of its successful employment in this disease.* From the various and highly respectable testimonies we have in relation to its powers, it is, without doubt, entitled to much attention as a remedy in this affection. In order to obtain its beneficial effects as an anti-epileptic, this preparation should be given in as large doses as the stomach will bear. Dr. Powell observes, that the nitrate of silver may be taken into the stomach in much larger quantities, without inconvenience, in the form of pills than in solution. We may commence with one grain, and gradually increase the dose to three or four grains or more three times daily. Richter states, that this article seldom does any good unless the digestive organs are in a healthy and vigorous condition; and Dr. Harrison considers it particularly adapted to those cases which are connected with a morbid irritability of the nervous system.† I have given it in a number of cases; in one case only, however, did it prove permanently successful. Kruiger employed this article with success according to the following formula.‡ The nitrate of silver will sometimes manifest no beneficial effects until its use has been continued for many months. Toel (*Horn's Archives*, 1824) relates a case in which the paroxysms recurred regularly every month, at night during sleep, which yielded at last to this remedy after it had been regularly taken for more than a year and a half. It is a common practice to discontinue the use of this and other similar remedies, if no perceptible advantage is derived from it in the course of six or eight weeks. This, I am persuaded, is not unfrequently the source of defeat in our attempts to subdue this complaint. I once succeeded in curing a case of seven years' continuance, by persisting with the same remedy for nine months.

Tin.—This article has recently been strongly recommended in the cure of epilepsy. Dr. Shearman states, that in his hands the elutriated oxyde of tin has more frequently succeeded in curing this affection than any other remedy he has ever employed. He gave it in doses of from two scruples to one drachm, night and morning, for about four days. At the end of that time he ordered a purgative, and again gave this preparation, or not, according to its effects on the system.§ The filings of tin, given in large doses, have been used with success in epilepsy from verminous irritation by Richter, (*Asklepeion*, 1811, st. 67, s. 1060,) and Monro, (*A Treatise on Med. and Pharm. Chem.*, vol. i. p. 289.) From the acknowledged anthelmintic properties of this article, it is manifestly peculiarly adapted to cases which depend on irritation from worms.

Lead.—The acetate of lead has been employed with entire success in a few instances of this disease. About sixteen years ago, I succeeded in curing a case

* It has been used with success, in well marked and often long standing cases of epilepsy, by Sims, (Mem. of the Soc. of Lond., vol. vi. p. 397;) Cappe, (Duncan's Annals, for 1798, p. 56;) Bostock, Hull, Heberden, (Commentaries;) Sauchier, (Annal. de la Société. de Med. de Montpell., t. vii. pp. 369, 384;) Valentin, (ibid., t. viii. p. 182;) Heim, Nord, (Med. Nationalzeit., 1798;) Born, (Hufeland's Journal, bd. xlv. st. i. p. 93;) Shaeffer, (ibid., xlviii. p. 43;) Pitschaft, (ibid., bd. li. st. 3, p. 54;) Loebstein-Loebel, (Wesen u. Heil. d. Epilepsie, p. 243;) Portal, Fouquier, (Dict. des Sciences Méd., t. xxxvii. p. 120;) Harrison, Baillie, Roget, Johnson, (Cook on Nervous Diseases, p. 394;) Barladini, (Omodei Annal. di Medic., 1826, p. 41;) Jahn, (Arzneimittell., bd. i. and Klinik. d. Chron. Krankh., b. i. p. 283;) Kruiger, (Archiv. f. Med. Erfahr. v. Horn, Maertz, April 1823;) Toel, (ibid., 1824, Nov. and Dec.;) Biett, (Caspar. Charakt. d. Franzoesish. Med., p. 191.)

† [I have formed an opinion that it is especially serviceable in all those cases of epilepsy which are dependent upon sympathy with a morbid condition of the stomach; at least it has been in such cases only that I have had any success with the remedy.—Mc.]

‡ ℞.—Nitrat. argenti grs. vi.
G. opii grs. x.
Extract. gentian ℥i.
Extract. aloes ℈i.—M. Divide into two grain pills. Take one three times daily, increasing the number from time to time.

§ London Medical Repository.

with this remedy which had continued for upwards of seven years. The patient was a young man about twenty-two years old; and the disease was excited, in the first instance, by violent terror. The paroxysms returned regularly at each period of full moon. I prescribed three grains of sugar of lead mornings and evenings, commencing three days before the time of full moon, and continuing two or three days after this period. He took the medicine in this manner for nine successive lunar periods; but the disease did not return after the fifth period from the time the treatment was commenced.* Dr. Rush gave this remedy in two grain doses with complete success in a case of this disease;† and Drs. Spence and Agnew employed it, in some instances, with decided benefit. Saxdorph also gave it with marked advantage.‡ Quarin (*Animadv. Pract.*) and Portal condemn its use in epilepsy, as being inefficacious in small doses and dangerous in large ones.

Besides the foregoing remedies, many others have been used with advantage. Dr. Johnson speaks favorably of the internal use of cantharides; Dr. Kirkhoff has used the prussiate of iron with success; and Underwood has derived advantage from the use of savin.§

Mercury, with a view to its salivant effects, was formerly much recommended. Burserius speaks highly of the powers of cinnabar in this affection. Mercurials, particularly mercurial frictions, were used with success by Bang, Willis, Ettmuller, J. Frank, Tissot, Locher, and others.

Richter states, that the sulphuric acid sometimes produced the happiest effects in epilepsy. Advantage, however, is to be expected from its uses only in cases attended with a general nervous irritability, and erethism of the vascular system. In such cases, from two to four drachms of the acid should be taken during the day. Zimmerman, Tissot and Hildebrand (*Hufeland's Journ.*, bd. ix. p. 34), commend the anti-epileptic powers of this acid.

Various external remedial applications also have been recommended, and occasionally used with advantage in this affection.

Statements have been published which go to show that *galvanism* may occasionally be employed with benefit. It is said to be most efficacious in this disease when its influence is applied some time before the accession of the expected paroxysm, and (when the case is preceded by the *aura*), if the positive current of the galvanic fluid is passed through the part where the *aura* commences.‖ According to the experience of Mansford, little or no advantage is gained from galvanism in epilepsy, unless it be applied steadily and constantly, and only with a weak power. He thinks that the negative point should be as near the brain as possible, and the positive one in some distinct part of the body.¶

Electricity has also been recommended for the cure of epilepsy. Richter states that this agent has been employed in several obstinate cases with great advantage. Both galvanism and electricity, however, may do, and have done, unequivocal harm, particularly when applied with much force. It is only in cases attended with a torpid and unirritable state of the nervous system, that these powers appear to be applicable with a prospect of benefit.**

* New York Medical Repository, vol. ii. No. 1, 1815.

† Ibid., New Series, 1813.

‡ Osann. Dissertatio de Saturni Usu Medico, &c., 1809.

§ Dr. Ferrara, of Naples, has successfully treated an obstinate case of epilepsy in a young gentleman, by the employment of four or five grains of ipecacuanha every morning, and the same dose whenever any premonitory symptoms of the disease appeared. Dr. Gaetano Allegretti, another Italian physician, had recourse to this practice in four cases, in three of which a complete cure was effected.—*Am. Journ. of the Med. Sci.*, vol. viii. p. 241.

‖ Walther. Uber. d. Therapeutisch Indic. d. Galvanism. Richter, Specielle Thérapie, bd. vii. p. 716.

¶ Galvanism is favorably mentioned as a remedy by *Martens*, (Answeis. Zur. Therapeut. Anwend. d. Galvanismus, p. 333; *Whitlam*, (Med. and Phys. Journ., vol. xiv.) *Burdach.*

** Electricity is particularly recommended in this disease by Albans, Stoll, Kuihn, Spengler, Wilhelm, and others.

Setons and issues were at one time much used in epilepsy. Hippocrates cured a case by an issue on the crown of the head, (*De Morb. Sacro.*, § vii;) and Tulpius relates a case cured in the same way. Mead used blisters on the back of the neck with success, (*De Imperio Solis et Lunæ*, cap. xi.) Fabricius cured an obstinate case with a seton in the nape of the neck, (*Observ. et Epistol Franc.*, cent. i. ob. 41.) The *actual cautery* has also been successfully applied in this disease. Van Swieten, Heister, Willis, De Haen, Larrey and others have related cases cured by this severe application. This remedy is mentioned by the ancients as a cure for epilepsy, particularly by Cælius Aurilianus. (Richter.)

Larrey has published an account of some cases of epilepsy, in which local bleeding from the vessels of the head, and the subsequent application of moxas, blisters, and other counter-irritants, proved completely effectual. (*Revue Médicale.*)

Of late years a good deal has been said in favor of pustulation with tartar emetic ointment, as a remedy in this affection. Mr. John Creighton has related six cases treated by frictions with this ointment, along the course of the spine, with very obvious benefit, though not with entire success in any one.* More recently, Dr. Carter has given an account of five cases of epilepsy, which go to show the usefulness of this application.†

Music has been employed to overcome this distressing malady. Quarin states, by means of this delicious power he succeeded in gradually weakening and finally subduing the epileptic paroxysms in one case.

Whatever mode of treatment or remedies be employed, particular attention should always be paid to proper regulations in relation to the diet, exercise, and the action of the bowels.‡

Sect. IV.—*Catalepsy.*

We find this very remarkable and rare disease described in the books under a variety of names—such as *stupor vigilans*, *congelatio*, *extasis*, *catoche*, or *catochus*, *lethargus*, *carus catalepsia*, &c.

Catalepsy consists in a temporary suspension of consciousness, sensorial power and volition—the body remaining in the precise position in which it was when the attack came on, without coma, muscular rigidity, or spasm; the respiration and circulation continuing.

The attack generally comes on without any warning of its approach. In some instances, however, symptoms premonitory of the cataleptic seizure occur, such as vertigo, cephalalgia, flushed face, a certain inactivity of mind and body, pain in the præcordium, a feeling of heaviness or tremor in the extremities, forgetfulness, flatulent pains in the bowels, yawning, sensorial obtuseness, depressed spirits; and in some instances a sensation similar to the *aura epileptica.*

When the attack occurs, every part of the body remains in precisely the same position in which it was at the moment of the seizure. If the paroxysm comes on while the person is in the act of doing anything, as, for instance, drinking, the hand will be suddenly arrested with, perhaps, the glass near the lips and the mouth open. Even the expression of the countenance continues fixed during the cataleptic state, as at the moment of the attack.§ The eyes are generally

* Dublin Transactions, vol. iv. † Med.-Chir. Rev., vol. ix., July 1826.

‡ [I consider diet to be by far the most important part of medical treatment. In all cases attended with vascular excitement, a strict vegetable or farinaceous diet is absolutely necessary. I have cured several cases by this course. I took the hint from the case of an intimate friend, a native of Virginia, who had been afflicted with epileptic paroxysms from his childhood. After all other plans of treatment had failed, Dr. Chapman directed an exclusive diet of bread and milk. He persevered in this course for many months, and has never had a paroxysm since. An empirical practitioner in New England has cured hundreds of patients (whom he takes in to board at his own residence), by some drops of watery fluid, and bread and water diet.—Mc.]

§ Richter's Specielle Thérap., bd. viii. p. 471.

open, fixed, and slightly turned up. Sometimes they are spasmodically closed. One of the most remarkable circumstances of this affection is the wax-like flexibility (*flexibilitas cerea*) of all the members of the body, with sufficient tonic muscular action to cause an extremity, or the whole of the body, to remain in the exact position in which it is put by another person. Thus, if during the cataleptic state, the arm be raised up, or in any way extended or flexed, it will remain so until the paroxysm is over. To this, however, the eyelids sometimes form an exception. When they are closed, they will not remain open when separated with the fingers; and when open, they immediately separate again if forcibly closed, as soon as the force is removed. Van Swieten mentions an instance of the former,* and Heberden one of the latter.† In complete catalepsy, all the sensorial functions are entirely suspended, and the patient, on recovering, remembers nothing either of his own internal sensations, or of what is done about him during the paroxysm. The period occupied by the attack is a perfect blank in the patient's existence; and if the paroxysm comes on while he is conversing, or in the performance of any other continuous act, he will resume the thread of the conversation, or even finish the half-pronounced word, or continue his acts, as soon as the paroxysm is over, as if no interruption had taken place. Although voluntary motion is almost universally suspended during the cataleptic attack, cases have occurred in which locomotion continued, without, however, the least consciousness in the patient of its performance. Dr. Stearns‡ relates a case, in which, if the paroxysm came on while the patient was walking, the same pace was unconsciously continued. Dr. Good also relates a similar instance, in which the involuntary walking continued during the attack.§ Fernelius states that he saw a cataleptic patient who, when pushed forwards, walked with a regular and firm step.‖

In cases less perfect, some degree of sensorial power remains, and the patient retains an indistinct recollection of what occurred during the paroxysm, on emerging out of it. But even in cases of this kind, all power of voluntary motion, or of manifesting, in any manner, a consciousness of their situation, or a desire for anything, is wholly suspended. A case is mentioned by Galen,¶ in which the patient, one of his fellow-students, lay motionless like a log, with his eyes open; but he heard and remembered what occurred during the paroxysm. A remarkable case is related by M. M. Lenormand, seen also by Laennec and Récamier, in which there was complete immobility, rigidity of the whole body, pulse weak, expression of the countenance natural, and abolition of all the senses, except that of hearing; the patient (a young female) heard everything that was said in her presence, but was totally unable to make the least sign, or utter the weakest sound. In the course of the third week, her hearing also failed, and her limbs became flexible, and readily assumed any position in which her attendants placed them. During the intervals of the attacks, she suffered much anxiety and pain in the pit of the stomach.** It is even stated that instances have occurred of catalepsy on one side only.††

In some cases the respiration and pulse become so feeble as to be imperceptible, and the whole surface is cold and contracted, as in death. The flexibility of the limbs, however, remains throughout—a circumstance which is never observed in *dead* subjects.‡‡

The duration of the cataleptic attack varies from a few minutes to several days. A deep inspiration generally announces the return of consciousness, sensation and voluntary motion. In many cases the paroxysm passes off suddenly,

* Comment., vol. x. p. 183.
† Comment on the History and Cure of Diseases, p. 291.
‡ American Medical Register, vol. i. art. viii.
§ Study of Medicine, vol. iii. p. 387.
‖ Patholog., lib. v. cap. xi. p. 70.
¶ Lib. i. Prorrhetic., p. 756.
** Rev. Médicale, Juillet 1825.
†† De La Metrie, Abrege de la Theorie Chymique, &c., p. 278. (Van Swieten.)
‡‡ Fitzpatrick, Medical Commentaries of a Society, &c., of Edin., vol. x.

the patient recovering in an instant all his mental and physical powers. I saw a case lately with my friend Dr. Stadiger, which regularly recurred three or four times daily; and in which the paroxysms never continued longer than between one and two minutes, and always came on and passed off suddenly. In other instances, particularly in those of protracted duration, the attack goes off gradually, the power of feeling and motion generally returning first in the fingers, then in the arms, and finally in the whole of the body. In transient cases, the patient experiences no unpleasant feelings, or sensible diminution either of the mental or corporeal powers, after the paroxysm; in others, a feeling of weight and fullness in the head, with slight cephalalgia, lassitude, and some degree of sensorial obtuseness, remains for some time after the attack has passed off. The cataleptic attacks in some instances recur with more or less frequency for months or even years; but it has very rarely been found to assume a strictly periodical character. Sometimes several attacks may occur in the course of one hour.* F. Hoffman mentions the case of a woman in which upwards of one hundred paroxysms occurred during the period of forty days.† Occasionally individuals will suffer a cataleptic attack without ever afterwards becoming affected with it again.‡

Catalepsy sometimes succeeds, terminates in, or alternates or becomes complicated with other affections. Dr. Lenormand's case, already referred to, was a most remarkable instance of this kind. The patient, a young girl, laboring under pains in the stomach and menstrual irregularities, passed successfully through nostalgia, fever, obstinate constipation, chorea, trismus, trismal catalepsy, complete catalepsy, chorea, a species of somnambulism, and finally hysteric symptoms, during the period of about eleven months. The disease has been known to alternate or terminate in epilepsy, anomalous convulsive disorders, soporose affections, and mental derangement.§ It is sometimes modified by a very peculiar morbid excitability of the nervous system, giving it the character of *cataleptic hysteria*. In such cases, the patient will remain in a completely cataleptic state for some time, and then suddenly, without a recovery of consciousness, begin either to talk incessantly, or sing, or whistle, or declaim.‖ Fleisch calls this modification of the disease *catalepsis loquax*. (Richter.) Sometimes catalepsy is connected with a species of somnambulism, the patient lying in what is familiarly called a *trance*.

The *diagnosis* of catalepsy depends chiefly, if not wholly, on the wax-like pliability of the extremities, and their maintenance of the position into which they are placed by extraneous force, together with the entire impossibility of the least voluntary motion. (Richter.)

The affection described in the books under the name of *ecstasy*, though differing in some respects from catalepsy, as described above, appears to be only a modification of this latter disease, or at least not essentially diverse from it. In its general phenomena, *ecstasy* partakes both of the character of tetanus and catalepsy. In ecstasy, the whole mind is concentrated, and, as it were, fixed upon some particular object, and the motific nervous influx is strongly and regularly determined upon the extensor and flexor muscles; so that no other impression can affect the mind, and the whole body remains *rigid*. Authors, however, differ in their statements with regard to the state of the muscular system. Good says, that in ecstasy "the muscles are thrown into a rigid and permanent spasm, not incurvating the body as in the different modifications of tetanus, but maintaining it erect from an equal excess of supply (of nervous power) to the extensor and flexor muscles." Richter, on the contrary, states that the limbs may be

* Behreus.—Baldinger's Neu Magazin., b. ix. p. 207.
† Medic. Ration. System., t. iv. part iii. cap. iv.
‡ Vogel. Prælectiones de Cognosc. et Curand. Morb., p. 569.
§ Hirschel Gedanken von der Starrsucht., p. 13.
‖ Sauvages. Nosolog., t. ii. p. ii. p. 418. Richter, Specielle Thérapie, b. viii. p. 477.

bent by extraneous force as in catalepsy; but they do not, as in this latter affection, continue in the position they are placed, but obey the laws of gravity.* The higher grades of ecstasy are sometimes attended with visions, apparitions, &c., and may continue for many hours.† Osiander speaks of a variety of *partial* cataleptic affections, which sometimes attacks a single extremity in young females about the age of puberty. The limb swells suddenly, becomes insensible, incapable of voluntary motion, but remains pliable as in true catalepsy.‡

Causes.—This affection occurs much more frequently in females than in males. The period of life at which there appears to exist the greatest aptitude to catalepsy, is about the age of puberty. Persons of a nervous temperament, more especially when addicted to long and intense mental application, are said to be most subject to this affection.

The exciting *causes* of catalepsy appear to be as various as those of epilepsy. The disease not unfrequently arises from the influence of mental affections, especially from disappointed love. Tulpius relates a case of this kind;§ and Schilling has collected similar instances.‖ Violent anger, protracted grief, hatred, and sudden terror, have produced this affection.¶ Long-continued and intense mental application has excited the disease.** Wepfer knew a young man who always became cataleptic when he applied himself to mathematical studies.†† Fernelius saw a case brought on by close study. Repelled cutaneous eruptions, particularly itch and tinea capitis, have been known to give rise to this affection.‡‡ Suppression or irregularities of the menstrual evacuation, appears to be one of the most common causes of catalepsy; yet the catamenial disorder, as Richter observes, is probably itself often only a concomitant occurrence, depending, as well as the cataleptic affection, upon some other morbid condition, particularly on intestinal irritation. That irritation in the stomach and bowels is often the direct exciting cause of the disease, is abundantly demonstrated by the cases that have been published. Van Swieten mentions the case of a woman seized with "true catalepsy," to whom he was called. While standing by her "she suddenly vomited up two live round worms," and immediately the cataleptic affection ceased.§§ Similar cases are related by Thom, Jawandt,‖‖ Behrens, and others.¶¶ A constipated and loaded state of the bowels also has been known to give rise to this affection. (Hirschel.) Catalepsy has been frequently found to occur in intermitting fever. Cases are related in which each paroxysm of this fever commenced with a cataleptic state.*** Van Swieten quotes a case of this kind from Dodonœus; and Richter refers to Fleisch and Hirschel for similar instances. Tissot has seen catelepsy produced by carbonic gas. It is said to have been excited by pregnancy.††† *General plethora;* organic affections within the head; masturbation, &c., are also enumerated among the exciting causes of this disease.

It would be in vain to enter into any speculations concerning the *proximate* cause of this affection. We may, indeed, observe, that there appears to be a complete dissociation between the moral and corporeal elements of the human

* Loc. cit., bd. viii. p. 481.

† Braumer, de Differentia Ecstaseos et Catalepseos—as quoted by Richter.

‡ Osiander, Denkwuirdigk, &c., b. i.

§ Observ. Medicar., lib. i. cap xxii— as quoted by Van Swieten.

‖ Disser. Ægrum ex Amore Catalepticum Factum Exhibens. (Richter.)

¶ Richter, Specielle Thérap., b. ix. p. 488.

** The case already quoted from Galen was produced "by too much study." Van Swieten, loc. cit., t. x. p. 193.

†† Observ. Med. Prac. de Affect. Capites, obs. 66.

‡‡ Burserius Instit., vol. iii. p. 137. Dufour. Journ. de Méd., t. lxx. p. 418.

§§ Loc. cit., t. x. p. 191.

‖‖ Hufeland's Journal, b. iv. st. iv. p. 784.

¶¶ [One of my patients, a delicate female, was attacked with general catalepsy from eating a quantity of charcoal, and, I am sorry to say, drinking gin, and Cologne water. She was persuaded to discontinue these injurious practices, and the disease never recurred.—Mc.]

*** Medicus Samml. u. Beobacht., b. ii. p. 372. (Richter.)

††† Osiander, Entwicklungs Krankheiten, &c., b. i. p. 182.

system, so that the former can no longer be affected through the latter, or *vice versa*. At the same time, however, that the mind is thus incapable of being excited, or of exciting the body, the brain continues to secrete and transmit the motific influence to the muscular system, although its distribution is wholly beyond the control of volition. That the muscles are furnished with a regular influx of the nervous power, is evident from the fact, that the cataleptic patient, though entirely without consciousness and sensorial power, will maintain not only an erect and firm posture, but support the extremities in positions in which they can be kept only by a regular and equilibrious action of the flexor and extensor muscles. The metaphysician might draw interesting inferences from the phenomena of this disease, concerning the essential distinction between mind and the mere physiological functions of the sensorium commune. This, however, is not the place to indulge in speculations of this kind.

The *prognosis* in this affection cannot, in general, be regarded as very unfavorable. Van Swieten observes, "I have both seen from practical observations myself, and it appears from undoubted observations of celebrated physicians, that a great many have recovered from this disease and afterwards enjoyed a perfect state of health."* Tissot makes the same remarks from his own experience. It may, nevertheless, terminate in fatal apoplexy, or in epilepsy, coma, melancholy or mania, and occasionally, though very rarely, the cataleptic paroxysm has been known to terminate fatally without the supervention of any other affection. (Richter.) In protracted cases of catalepsy, the mind generally at last suffers more or less impairment of its powers; and in some instances, atrophy, emaciation, or dropsy, is its consequence. When the cataleptic paroxysm is succeeded by weakness and numbness in some part of the body—particularly of one or more of the sensorial organs, together with a sense of weight, fullness and confusion in the head or inactivity and absence of mind, the prognosis is particularly unfavorable with regard to its sanability; and the same remark applies to those cases which alternate with chorea, mania, or epilepsy. The occurrence of spontaneous sanguineous discharges—as hæmorrhois, epistaxis, or the catamenia, has been known to put a stop to the further recurrence of the disease. Those cases which come on about the period of puberty, often cease spontaneously after this stage of physical development has been fully passed over. Instances that depend on gastric irritating causes—such as worms, accumulated fecal matter, acrid secretions, or other movable, offensive substances—are in general most easily cured.

Treatment.—In general the treatment of catalepsy does not differ materially, either in its particular indications, or remedial measures, from that which has already been described under the head of epilepsy. When the paroxysm is protracted, small doses of sulphuric or acetic ether may be administered, if the power of deglutition remains, and there are no signs of cephalic congestion present. Great caution, however, is to be practised in the use of internal stimulants. Frictions along the course of the spine, fomentations or stimulating applications to the feet, and enemata, may sometimes contribute to the removal of the paroxysm. When evident signs of vascular congestion of the head are present, and the pulse is not very feeble, blood should be taken from the arm, or by means of cups from the temples or back of the neck, and sinapisms or warm applications made to the feet, together with the use of purgative enemata. If a purgative can be introduced into the stomach, it ought, by all means, to be done—more especially when there is reason to apprehend the presence of irritating matters in the intestinal canal. Reil states, that he once saw a girl affected alternately with mania and epilepsy, which instantly went off, on the expulsion of a number of lumbrici by anthelmintics and enemata.† Galvanism and electricity, also, have been recommended in the cataleptic paroxysm; but they must not be applied in a strong degree. Richter refers to an instance, related by Thom, in which a young lady

* Commentaries, vol. x. p. 197.

† Fieberlehre, bd. iv. p. 72.

who was passionately fond of music, was roused from the cataleptic state by this delicious influence. Hard tones produced no effect on her, but soft and melodious ones brought tears from her eyes, and roused her as from a dream.

The treatment proper during the intervals of the cataleptic paroxysms, with the view of preventing their recurrence, should accord with the character of the occasional cause, the patient's constitutional temperament, and the state of the vascular system. In the cases that occur about the period of puberty in females, active or exciting remedies will seldom do any good, but, on the contrary, often prove decidedly prejudicial; and when such instances are connected with suppressed or irregular menstrual function, the active emmenagogues should be particularly avoided. (Richter.) A proper regulation of diet, country air, regular exercise, tepid bathing, sea-bathing, chalybeates, and laxative mineral waters, will often do more in cases of this kind than any other course of remedial management. Where symptoms of gastric and hepatic derangement are present, the occasional use of four or five grains of blue pill, with a course of gentle laxative and tonic medicines, will often prove beneficial. A state of general plethora will require an abstemious mode of living, and abstractions of blood; verminous irritation demands anthelmintics; repelled cutaneous diseases call for external vesicating, pustulating, or irritating applications, with a gentle course of alterative and diaphoretic remedies; and a general excitable and weakened state of the nervous system requires tonics, with antispasmodics, the narcotic extracts, or camphor, exercise in the open air, and the use of the tepid shower bath. Stark cured a case of catalepsy by assafœtida, galbanum, and infusion of the bulb of pæony; the extract of hyoscyamus, oxyde of zinc, valerian, musk, castor, and opium, (Grenier,) have been successfully employed. Marx speaks very favorably of the powers of acorns in this affection. The sulphuret of iron, and belladonna, with the fetid gums, have been used with success; and Loebstein-Loebel recommends the use of phosphorus. In short, nearly every remedy that has already been mentioned under the head of epilepsy, has been advised, and may perhaps be beneficial in certain varieties of this disease. The nitrate of silver, the elutriated oxide of tin, flowers of zinc, mercury, cuprum ammoniacum, and the various antispasmodic and narcotic remedies, have all been used, and sometimes, it is said, with success.

Sect. V.—*Chorea—St. Vitus's Dance.*

The first distinct account which was given of this disease is to be found in the writings of Plater and Sennertus, both of whom lived about the close of the sixteenth century.* Since that period it has been described under a variety of names, expressive of that peculiar saltant action of the extremities which characterizes the disease, such as *chorea St. Modesti; saltus viti; choreomania; ballismus; orchestromania; epilepsia saltatoria; dance de St. Guy.*

The name *St. Vitus's Dance*, by which it is now familiarly known, was derived, according to Horst, from the chapel of St. Vitus, near Ulm, to which women laboring under a certain nervous affection were in the habit of resorting every spring, where they danced violently and unremittingly from morning to night, until they sunk down completely exhausted, into a swoon, or kind of ecstacy, by which exercise they fancied themselves cured for one year. Some writers place its origin at a much earlier date, deducing it from the very remarkable dancing mania which prevailed throughout Germany in 1374, and which, as it was thought to be the malicious doings of Satan, was generally treated by ex-

* It has been supposed that Hippocrates alludes to chorea in the following passage, according to the version of Fœsius: "Medulla spina affecta homo nec crurum aut ventris officio potens est, nisi urgente necessitate; si vero morbus invaluerit tum aliquando præter voluntatum mejit et egerit."

orcism; and it is said that the monks of the convent of Korbey were particularly fortunate in casting out the fiend under the holy influence of their patron, *Saint Veit.*

Chorea rarely, if ever, comes on suddenly. Its approaches are always gradual under a variety of premonitory symptoms, varying in duration from a few days to several months, indicative of a deranged state of the digestive organs and nervous system. The most common of these symptoms are slightly flatulent pains in the stomach or bowels, variable appetite, constipation, tumid and hard abdomen, occasionally vertigo, anxiety and a feeling of oppression in the præcordial region, slight tremors, and heaviness of the extremities, oppression in the chest, frequent palpitations, visual illusions, fullness in the head with temporary confusion of mind, a feeling of tension in the forehead, itching in the nose, cold feet, variableness of disposition fluctuating between gloom and cheerfulness, and in some instances a remarkable proneness to mischievous and unruly conduct.

After some or perhaps a majority of these manifestations of deranged health have continued for a longer or shorter time, irregular muscular twitches or spasmodic contractions are observed in the face or one of the extremities. These spasmodic actions are at first slight and only occasional, and are particularly noticed on the sudden occurrence of anything that flurries the mind. With more or less rapidity, however, they become stronger and more constant, until, at times, almost every muscle of the body is in a state of continued involuntary action. Not unfrequently, the morbid muscular action is almost entirely confined to one side of the body; and this is generally the left side. (Richter.)* From the imperfect command of the will over the voluntary muscles, the patient, when he attempts to walk, has a starting, hobbling, and irregular gait, with an awkward dragging of one of the legs. Sometimes the involuntary muscular actions are so violent, and the empire of volition over them so completely lost, that progression, and even an erect posture, are rendered wholly impossible.† The hands and arms, too, are in constant motion; the patient is often entirely unable to direct them; and in all cases, various ineffectual efforts are made before the hand can be brought to the desired point. Thus, in conveying food or drink to the mouth, the hand is generally forced in almost every direction except the intended one, and is at last brought to the lips only after a number of unsuccessful efforts.

The contractions of the muscles of the face are sometimes extremely severe and irregular, giving a continual varying expression to the countenance, often of the most ludicrous cast, and occasionally truly frightful. The head is sometimes thrown from side to side, or backwards and forwards, the mouth suddenly widely opened and again forcibly closed, the tongue rapidly thrust out of the mouth, and retracted, and the eyelids are in continued irregular motion. In violent cases, deglutition is much impeded, and occasionally, for a short time entirely prevented, by the spasmodic action of the pharynx and œsophagus. Respiration also is often anxious and irregular; the voice is altered, and articulation is indistinct and stuttering. Almost every voluntary muscle, in short, is at times in a state of uncontrollable and dissociated action. The authority and commands of volition are disregarded, and the whole muscular system is thrown into a state of revolt, its actions being irregular, lawless, and destructive to the welfare of the general constitution.

At first the expression of the countenance, in the intervals of the spasmodic motions, "is that of good humor and contentment;" as the disease advances,

* Cases have been related, in which one leg and the arm of the opposite side alone were affected. (*Woeltche, Observationes, Medicin., Fascicul., Richter.*)

† Occasionally all the muscles suddenly become completely relaxed; and instances have been known where the extremities have been so violently distorted as to dislocate some of the joints. (*Bruickman, Enerratio Choreæ St. Viti et Epilepsia per Fontis Medicatos Emenses Curatæ. Hufeland's Journal*, bd. iii. st. iv. p. 612. *Richter, Specielle Thérapie* bd. vii. p. 735.) A case is mentioned in Baldinger's Magazine, st. xii. p. 1095, in which the elbow-joint was dislocated, and in a few minutes again replaced by the violent contortions of this disease.

however, the eyes lose their wonted lustre and intelligence, the face becomes pale, expressive of languor, and at last acquires a fatuous expression. Fleisch observes, that in many instances patients affected with this disease evince a peculiar and apparently irresistible propensity to creep into holes, boxes or closets so narrow that it is sometimes difficult to extricate them from their confined situations.*

The temper and mind almost always become more or less affected in cases of a protracted character, more especially in very young subjects. I have seen several cases in which complete and permanent weakness of intellect was the consequence of this disease. In some instances, the patient occasionally lapses into a kind of *ecstasy* or somnambulism. (Richter.) Slight paralysis sometimes occurs on one side of the body. Nearly three years ago, I attended a child affected with this disease, in which incomplete hemiplegia and amaurosis in both eyes took place; and it is only within the last ten months that these paralytic affections have wholly gone off.

Sometimes chorea assumes very extraordinary forms. In some cases the patient is seized with paroxysms of violent dancing, leaping or stamping, accompanied with various antic contortions of the body; at others there is a rapid and forcible beating with the hands against some part of the body, particularly the knees; occasionally an irresistible propensity to leap upon chairs, tables, and to clamber up the walls of the room, is manifested; and patients have been known to stand erect and turn round like a top on the toes. Fever is not a necessary attendant on chorea, but when the disease continues long, the muscles become wasted and flaccid, and in cases of a very obstinate and protracted character, slow febrile irritation ensues.

During sound sleep, when volition is in a state of temporary suspension, (with regard to its influence over the voluntary muscles,) all the spasmodic motions which characterize this affection cease entirely. Indeed, the efforts of *volition* during the waking state often manifestly aggravate the involuntary action of the muscles. It would seem that the stimulus of the will is in some degree essential to the production of the irregular muscular motions.

Chorea is a paroxysmal affection. In most instances several distinct paroxysms occur daily at irregular periods, with little or no spasmodic action during the intervals. Sometimes, however, violent exacerbations take place once, twice, or oftener daily, with more or less of choreal action throughout the intervals. Occasionally, though indeed very rarely, the occurrence of the paroxysms is strictly periodical.† There is much diversity also in relation to the duration of the paroxysms. Sometimes they do not last more than ten or fifteen minutes; more frequently they continue for an hour or two, and occasionally they commence in the morning and do not cease until the patient sleeps at night. Cases have occurred in which the paroxysms continued with no obvious remission for six or seven days.‡

The touch of iron is said sometimes to have a very extraordinary effect upon this disease. Wichmann,§ Richter, and others, assert that the peculiar spasmodic actions of this affection either cease instantly, or become greatly aggravated, if the patient places his hands on a piece of cold iron during the paroxysm; and Stark says that he has often known the same effect produced by sprinkling cold water on the patient, or merely by touching him with a cold hand.‖

Chorea appears to be closely allied to the *tarantismus* of Apulia, an affection which has, indeed, by some, been regarded as a mere modification of this disease.¶ The *beriberi* of India, also, would seem to be somewhat similar to chorea;

* Handbuch der Krankheiten der Kinder, &c., b. iv. p. 419. Richter, loc. cit., p. 734. Wichmann, Ideen zur Diagnostick, b. i. p. 137.

† Mead, Opera., tom. i. p. 32. ‡ Vogel, Stark, Richter.

§ Ideen zur Diagnostick, bd. i. p. 153.

‖ Handbuch zur Kentniss u. Heilung innerer Krankheiten & Th., iii. p. 164.

¶ Swartz. Dissert. de Tarantismo, &c. Richter.

and that singular convulsive affection, described under the name of *raphania*, which, from the latter part of the 16th to the middle of the 18th century, appeared in frequent and extensive epidemics in various parts of Germany and France, bore, in many respects, a close resemblance, in its chronic form, to the present disease.

Whether those remarkable nervous and spasmodic affections, which have been known to result from religious enthusiasm or frenzy, are to be regarded as instances of chorea, is very doubtful. Many very extraordinary examples of this kind have been related. Wierus gives an account of a choreal affection which occurred among the nuns of the convent of St. Brigitta. They were seized with occasional paroxysms of screaming, dancing, leaping upon chairs and tables, and various other ludicrous contortions and motions of the body.* The same writer gives the history of a somewhat similar affection, which prevailed in 1564, among the nuns of the convent Nazareth, near Koelln, the paroxysms of which were attended with very un-nun-like actions. "*Infima* corporis parte," says Wierus, "succusata ad eum modum qui veneri solet ascribi, oculis interim clausis," and it was concluded that nothing but the malicious workings of Satan could produce such mortifying and uncongenial phenomena.

Dr. Robertson, in his inaugural dissertation, states, that some years ago, an affection, resembling chorea, appeared among a religious sect in Tennessee, in consequence of an enthusiastic and noisy mode of worship; and was extensively propagated by the influence of imagination, or moral sympathy.†

Causes.—Chorea very rarely attacks persons beyond the 20th year of age;‡ and its occurrence before the 8th year is equally uncommon. Sydenham, Wichmann, and Thilenius, never met with this disease in children under ten years of age; but its occurrence even in early infancy is unquestionable. About three years ago I met with an instance of well-marked chorea in an infant less than nine months old. This case was seen also by Dr. Parrish. Hamilton,§ Gregory, and other writers, assert that the disease attacks girls and boys indiscriminately. Judging from my own observations, I should infer that females are by far more liable to it than males; and this inference is supported by the observations of several eminent writers. Van Hoven makes the relative proportion of males and females affected with chorea, as about two to twenty.

The constitutional habit most favorable to the occurrence of this disease, is that peculiar excitable state of the common sensorium, constituting what is usually called the nervous temperament. It is said that a predisposition to chorea is sometimes hereditary, but this depends probably simply on the hereditary transmission of the general constitutional temperament. Cullen, Wichmann and Jahn‖ state that this otherwise not very common disease has been known to occur with unusual frequency during particular years or seasons; and it has been supposed, from this circumstance, that certain atmospheric constitutions may create a predisposition to its attacks.

The following are the principal *exciting causes* of chorea: 1. *Mental emotions*, particularly terror, fear, disappointed love, and religious enthusiasm. 2. *Gastro-intestinal irritation* from worms, accumulation of fecal matter, and other irritating substances lodged in the intestinal canal. Hamilton and other late writers consider this as by far the most common source of chorea. That the disease

* J. Wieri, lib. de Præstigiis, p. 378.

† The Rev. Mr. Hoge, in a letter to the Rev. Ashbel Green, of this city, dated September 10, 1801, speaking of the Methodist revivals, says: During worship the members of the meeting "drop down on every hand, shrieking, groaning, crying for mercy, *convulsed*; professors praying, agonizing, fainting, falling down in distress for sinners, or in raptures for joy! No spectacle can excite a stronger sensation. I am told by the subjects of it, that a tremulous benumbing sensation seizes the extremities, particularly the fingers, which rapidly spreads through the system, the knees become feeble, the heart violently compressed, and the person drops to the ground."

‡ Dr. Powel knew an instance in which this disease occurred in a person in the 50th year of age.

§ On Purgatives, &c. ‖ Klinik. der Chronisch. Krankheit., bd. i. p. 245.

very frequently arises from causes of this kind admits of no doubt. Its origin from intestinal irritation is not, however, so common, I think, as is alleged by Dr. Hamilton. Certain I am, that in the majority of instances that have come under my notice, the exciting cause did not appear to be located in the alimentary canal, and little or no advantage was derived from the remedies usually found beneficial in cases unequivocally dependent upon causes of this kind. Cases of chorea have been reported, which ceased almost immediately on the expulsion of worms—particularly the tape-worm.* 3. *Repelled chronic and acute cutaneous eruptions.* Bisset, an English physician, relates a case which came on in consequence of the repulsion of *itch.* Wendt saw an instance produced by the imprudent drying up of tinea capitis; and other authors mention cases excited by repelled small-pox, and miliaria. (Richter.)† 4. The *suppression of habitual discharges*, more especially of the menses. A case of chorea, in a girl about fourteen years of age, terminated fatally in less than three weeks. On dissection, the whole body of the uterus was found as hard as cartilage, and completely scirrhous.‡ 5. *Unsatisfied* or *over-excited sexual propensities.* Richter states that chorea has been frequently cured by marriage. 6. Vegetable and mineral poisons have also been known to produce this affection. Stramonium, (*Comment. Litter. Norimburg*, an. 1774,) mercury, (De Haen, *Ratio Medend.*, tom. iii. p. 202,) and lead have excited paroxysms of chorea. Dentition, pregnancy, parturition and cold, are also mentioned among the exciting causes of this affection; and it appears frequently to depend upon rapid corporeal evolution, or that peculiar change of constitutional habit which occurs at the age of puberty.

The *pathology* of chorea derives little or no light from anatomical examinations. There are good reasons, however, for believing that it is essentially a cerebral affection. Its frequent occurrence from mental excitement; the intellectual weakness which almost invariably results from its protracted continuance; the suspension of the convulsive motions during sound sleep; and its exclusive confinement to the voluntary muscles, point directly to the sensorium commune as the immediate source of the irritation upon which the spasmodic actions of the disease depend. Unquestionably, however, the cerebral irritation is itself very frequently secondary, depending on a primary irritation, located in some remote part of the system, and frequently, perhaps, in the alimentary canal. In some cases which I have seen, it appeared to me that the irregular muscular motions were not so much the result of *involuntary* muscular actions as of an *irresistible volition* to perform these peculiar motions. In those instances of the disease, at least, that are characterized by leaping on tables, chairs, dancing, clambering up walls, and other similar actions, the propensity or *will* to do so appears to be irresistibly exerted; and we might, with some plausibility, ascribe the characteristic phenomena of the disease to a morbid action of the faculty of volition, depending generally on a sympathetic, and sometimes an idiopathic irregular excitement of the brain.

Richter thinks that the proximate cause of chorea is seated in the system of ganglionic nerves, and particularly in the abdominal plexus. It is from this location of the primary irritation, he says, that the first manifestations of the disease generally occur in the feet; that gastric and uterine irritation so frequently constitute its exciting cause; and, finally, that those remedies which act more especially upon the abdominal viscera, are usually the most beneficial. All these circumstances may, however, be adduced with equal plausibility in favor of the cerebral pathology of this affection.

Prognosis.—Chorea very rarely proves fatal, but it cannot be said to be

* Albers. Hufeland's Journal, bd. i. p. 152.—Baldinger's Neues Magazin., bd. ix. p. 189.

† A case of chorea consequent upon scarlet fever came under my observation recently, and slowly yielded to remedies.

‡ Richter's Specielle Thérapie, bd. vii. p. 749, quoted from Wiegand's Magazin. fur Geburtsh., 1808, st. ii.

entirely free from danger, as some writers have asserted.* I have known one instance to terminate fatally, by the supervention of a slow and wasting irritative fever. Occasionally it is converted into epilepsy, and may prove fatal through the intervention of this affection.† The duration of chorea varies greatly. It may continue only a few days, or several weeks, months, or even years. The more violent and protracted the paroxysms are, and the more the mind has become affected by its attacks, the more difficult, in general, will it be to effect a cure. When the disease becomes very protracted in its course, it rarely fails to weaken the intellect; and it has occasionally terminated in mental derangement, particularly in melancholy. Richter observes, that when chorea is complicated with other affections—as chronic pectoral diseases, scrofula, fluor albus, and in general with a debilitated and shattered state of the nervous system, the prognosis is unfavorable. When it arises from the irritation of worms or other substances in the alimentary canal, it is generally readily cured by proper remedial measures. It appears to be less apt to yield, when it has been excited by terror or other violent emotions of the mind. Instances that occur about the thirteenth or fourteenth year of age in girls, generally continue until the sexual development is completely accomplished. Cases of this kind, if left to themselves, almost universally terminate spontaneously after the regular establishment of the catamenia. When the disease is arrested by remedial treatment before the changes of puberty have been accomplished, it is apt to return, and to manifest itself at intervals until the period of adolescence is passed.

Treatment.—The principal indications in the treatment of chorea are, 1. To remove or counteract the exciting cause; 2. To invigorate the general system; and 3. To break up the train of associated actions by which the paroxysms are repeated or continued.

As the ordinary cases of chorea are almost always devoid of danger, and often terminate spontaneously, after having for a considerable time resisted remedial treatment, it is not in general advisable to resort at once to very energetic remedies or modes of treatment. This observation applies particularly to those cases which depend on that peculiar constitutional metamorphosis which occurs during the period of puberty; for we may calculate almost with certainty on the spontaneous termination of such cases as soon as this stage of corporeal development is fully completed.‡

Every one knows how strongly *purgatives* are recommended in the treatment of this affection, by Dr. Hamilton, of Edinburgh; and this practice has since obtained pretty general approbation in England and in this country.§ When the bowels are in a torpid state, with an accumulation of fecal matter, free and repeated purgation is, without doubt, a highly important measure; and in all cases, indeed, laxatives must be regarded as useful auxiliaries. That the power of this class of remedies as a curative measure, is, however, considerably overrated by Dr. Hamilton and others, I am much inclined to suspect. I have treated twelve or thirteen cases according to the plan laid down by this highly respectable writer, but have not, in more than two instances, derived the advantage from it that I was led to expect from his statements. As a preparatory and auxiliary measure to tonic and other suitable remedies, moderate purging will rarely fail to do good; but I question much whether any decisive impression can be made on this dis-

* Wichmann, Baumes.

† Wiegand, Hamburg. Magazin. Fuir. die Geburtsh., st. 1808.

‡ The importance of attending to these circumstances is particularly insisted on by Richter. Specielle Thérapie, bd. vii. p. 755.

§ The employment of *active* purgatives for the cure of this disease was strongly recommended long before the time of Dr. Hamilton. Stark speaks highly of the good effects of very active purgation in this disease. (Acten d. Kurfuistl. Academie der Wissenshaften, 1776, p. 193.) Unzer also employed drastic purges with success in chorea. Sydenham treated this disease by purgatives and bleeding on alternate days, with an opiate at night. (*Schedula Monitoria de Novæ Febris Ingressu*, an. 1665.)

ease by purgatives alone, except in cases depending on intestinal irritation, from fecal accumulations or other irritating substances lodged within the bowels. Where the signs of gastric impurities, or of a loaded state of the bowels are unequivocal, mercurial purgatives should be given daily, or every other day, until there is reason to believe that the offending matters are evacuated, and the biliary secretion improved.* After the bowels have been freely evacuated, tonics should be used in alternation with laxatives. The quinine, or any of the ordinary bitter infusions, will answer for this purpose. Whytt says that he has known the supervention of diarrhœa to put a permanent stop to chorea; and the very remarkable case, reported by Dr. Watt, after *active* purgatives and a great variety of other remedial means had been ineffectually employed, terminated at last on the occurrence of profuse spontaneous diarrhœa. (*Med.-Chir. Transact.*, vol. v.)

In some instances, coming on from retained or suppressed menstrual evacuation, the general diathesis is manifestly phlogistic. Here, along with aloetic purges, it will be proper to *bleed*, and to put the patient on a mild vegetable diet, with an occasional dose of Dover's powder in the evening. About three years ago I attended a young lady who was seized with chorea, apparently in consequence of suppressed catamenia. Her pulse was small, sharp, and tense; the skin generally dry and warm, and the bowels constipated. I directed her to be bled to the extent of twelve ounces, and to take one of the pills mentioned below,† every night, and a small dose of sulphate of magnesia every fourth day. In the course of two weeks she was bled four times, and the disease disappeared during the third week. The menses did not reappear until five weeks afterwards.

When the disease attacks persons of a highly excitable state of the nervous system, or of a strongly marked nervous temperament, peculiar benefit may often be derived from the cautious exhibition of antispasmodic and narcotic remedies. Valerian, *assafetida in union with quinine*,‡ musk, hyoscyamus, camphor, and opium, under judicious management, will sometimes do much good in cases of this kind.

In cases depending on suppressed catamenial discharge, attention must, in the first place, be paid to the alimentary canal. Laxatives, a mild and simple diet, with a few grains of blue pill at night, must be employed until the bowels and liver are brought to a healthy condition. When this is effected, recourse may be had to remedies more directly calculated to promote the flow of the menses—particularly to turpentine, warm pediluvium, cantharides, blisters over the sacrum, small doses of aloes,§ and where the general habit and pulse are languid, savin and black hellebore. Richter says that in one instance of this kind, he gave twelve grains of *borax* three times daily with speedy and complete success. It should be recollected, however, that retained or suppressed menstruation may *accompany* chorea, without having any agency in the production of this affection—the catamenial disorder being itself only a concomitant effect of some previous general morbid condition of the system. It will, therefore, be more

* Hamilton recommends full doses of calomel and jalap. I have generally preferred using the following pills:

℞.—Extract colocynth. comp. ʒi.
Calomel ʒss.
Tart. antimonii gr. i.—M. Divide into twenty pills. S. Take one, two, or three, according to the age of the patient, every other day.

† ℞.—Massæ hydrarg. ʒi.
G. aloes ʒss.
Tart. antimonii grs. ii.—M. Divide into twenty pills.

‡ Within the present year I have seen very decisive advantage obtained from the use of the following pill, taken every four hours, after proper evacuations had been premised:

℞.—Sulphat. quinæ ℈i.
G. assafœtid. ℈ii.—M. Divide into twenty pills.

§ The compound tincture of aloes, in doses of from fifteen to twenty drops three times daily, is one of the best aloetic preparations for this purpose. Small doses of *hiera-picra*, also, frequently answer peculiarly well, when there is considerable weakness of the stomach present.

accordant with correct principles of practice, to endeavor rather to remove that general morbid condition upon which both the menstrual irregularity and the convulsive disorder depend, than to make vain, and too often injurious, efforts to restore the menses with active emmenagogue remedies. When, therefore, relaxation, debility, or a general leucophlegmatic state is present, tonics, particularly *iron*, a regulated diet, ventilation, and exercise by gestation, should be chiefly depended on; and, on the contrary, where the diathesis is phlogistic, the body plethoric, and the skin dry and warm, recourse must be had to depletion, purgatives, a vegetable or farinaceous diet, leeching about the pelvis, &c.

When chorea arises in consequence of suppressed perspiration from cold, or the retrocession of cutaneous eruptions, antimonials, Dover's powder, camphor, warm aromatic ptisans,* the warm bath, blistering, rubefacient frictions, the internal use of sulphur, issues or setons, and a warm and equable temperature, are appropriate remedial measures. It is scarcely necessary to say, that where *verminous* irritation is manifestly present, anthelmintics should be used. In instances that are excited by mental emotions, musk and opium are said to be particularly calculated to do good.

Considerable advantage may sometimes be obtained in the treatment of chorea, whatever be its exciting cause, from external applications—such as dry frictions with flannel, or blistering, or rubefacients, along the course of the spine; stimulating baths; the cold shower-bath, and sea-bathing. The cold shower-bath, after a proper course of evacuants, and in connection with the internal use of tonics, will generally contribute materially to the re-establishment of health. Frictions with *tartar emetic ointment* over the region of the spine, have been resorted to with entire success in some very severe and protracted cases. Mr. Hunter, of Glasgow (*Med. Recorder*, vol. 8), has reported an interesting case, which, after many ineffectual trials with other remedies, was speedily subdued by pustulation with this ointment on the scalp and over the spinal column. Dr. Wharton, of Virginia, also, has related a case which yielded to this treatment. (*Med. Recorder*, No. 33.) In the fifth volume of the *Amer. Journal of the Medical Sciences*, Dr. Byrne, of Baltimore, has given an account of two protracted and obstinate cases of chorea, in which pustulation along the course of the spine effected speedy cures. The first case had continued nearly two years; the mind was evidently impaired, "the appetite was bad, the tongue foul, and the bowels irregular, generally costive." The patient, a girl, was 13 years old, and had as yet never menstruated. The purgative plan of treatment was fully tried; afterwards, she was put on the use of tonics and antispasmodics, and finally subjected to a slight mercurial course. No advantage, however, was derived from these remedies. Strong tartar emetic ointment was then rubbed in along the whole spinal column, and repeated three times daily. "On the evening of the second day the eruption began to appear, and from that time to the present, the patient has never been affected with the slightest irregularity of muscular motion. Her mental faculties, in a short time, resumed their wonted energy, and her health was perfectly restored."†

If our endeavors to remove the disease, by a course of treatment founded on the indications furnished by the character of the exciting cause and the general state of the system, prove abortive, we may then resort to what the Germans, with strict propriety, call the *empirical remedies*, recommended in this affection.

Among these, the *flowers of zinc* have, perhaps, been most frequently employed, and favorably mentioned, as a remedy in chorea. Burserius,‡ Hand,

* Infusions of elder blossoms, eupatorium perfoliatum, catnep, sage, marjoram, balm, &c., will answer well for this purpose.

† [In a very obstinate and violent case of chorea complicated with rachitis, I once applied the actual cautery to the spine with prompt success. The patient was a delicate little girl, nine years old, the daughter of Mr. John M'Donel, of this city.—Mc.]

‡ "Nuper confirmatam et numeris omnibus absolutam choream St. Viti solo floram zinci usu, tuto, cito et cucunde curavi." Institut, vol. iii. p. 242.

Richter,* Stark, and Alexander,† relate instances of the successful employment of this article in chorea, and Dr. Beddingfield asserts that thirteen out of fourteen instances of this disease, in which he gave this remedy, yielded permanently to its influence.‡ In my own practice I have never obtained any decided benefit from this article. The sulphate of zinc, however, removed the disease speedily and permanently in one instance that came under my notice. The patient, a girl about twelve years of age, had already been affected with the disease for upwards of nine months, and had undergone various modes of treatment. A grain of this preparation was given three times daily; and, without any other remedies, the disease disappeared in less than ten days. A case is related which yielded speedily under the use of this article, given in doses of three grains, mornings and evenings.§

Cuprum ammoniacum has also been used with success in chorea. *Willan* cured a case in a very short time with this article.‖

The *nitrate of silver* has succeeded in removing this affection. I have used this article with success in a case that was excited by terror; but in no other instance has it appeared to be beneficial in my hands, although I have employed it in eight or nine cases at least. Dr. Franklyn cured a case of chorea by the conjoined employment of this article and cold affusions, (*Lond. Med. and Phys. Journ.*, No. lxviii.;) and Dr. Powell used it with marked advantage in this affection. (*Transact. Lond. College of Phys.*, vol. iv.)

The *rust of iron* will sometimes succeed better than any other remedy of this kind in the removal of this affection. The little patient, whom I have already mentioned, was cured by this article. I had employed a course of purgatives, the nitrate of silver, flowers of zinc, and vesication along the spine and on the back of the neck, without any apparent benefit. By the advice of Dr. Parrish, the rust of iron was given; in less than three days a very decisive impression was already made on the disease, and in about three weeks all the convulsive motions were removed. I have since used this article in two instances with success. One of these, a little girl, was cured by it about two years ago. Within the last six weeks, she has again been seized with the disease, and in this attack I have not been able to obtain any advantage from the iron. It should be given in large doses. Dr. Elliotson administered this article in very large doses—from a drachm to half an ounce three times daily. He relates eight cases, all of which were cured by this remedy. (*Med.-Chirurg. Transact.*, vol. xiii.)

Chenopodium ambrosioides has been highly extolled for its powers in this disease. It was first recommended by Plenck, and has since been used very successfully by Mick, Ecker, and others.¶ It is given in powder, from one scruple to a drachm, two or three times daily.**

Camphor.—No small number of cases have been published illustrative of the good effects of this article in chorea. Pitt used it successfully in combination with valerian; and Wilson (*Med. Comment., Edinb.*, vol. ii.) reports a case which yielded under the employment of camphor and assafœtida. Richter says that this article is particularly useful in cases attended with seminal irritation, or in such as are produced by inordinate venereal indulgence.

A variety of other remedies are said to have been used with advantage in this

* Medic. and Surg. Observat., p. 153. † Duncan's Annals.

‡ Compendium of Medical Practice. Part i. chap. x.

§ Memoirs of the Med. Society of Lond., 1773, vol. x.

‖ Lond. Med. Journ., vol. iii. p. 11, p. 187.

¶ Pinel's Nosography—Translated into German by F. V. Ecker.

** I have used this plant in several cases of chronic hysteric affections with marked benefit. I usually employ it in the form of infusion—an ounce of the herb to a pint of boiling water—in doses of a wineglassful four or five times daily. It is particularly useful in cases attended with a feeling of numbness in the extremities, and with much gastric disturbance from flatulency.

The chenopodium ambrosioides is one of the most common weeds in the neighborhood of this city. It grows in the streets and along the fences in almost every part of the suburbs.

affection. Werlhof cured the disease with the *animal oil of Dippel.** *Cardamine pratensis* is recommended by Michaelis and Naegel; Stoll recommends the extract of belladonna, and Dr. Kerrison succeeded in curing an obstinate case with it.† Stramonium has been successfully employed in this affection by Kreysig, Hufeland, Odhelius, and Sidrèn.‡

Fowler's arsenical solution proved very beneficial in the hands of Dr. Newnham.§ Dr. Raven has published four cases in which the *tincture of colchicum* was used with great benefit.‖ In one instance of a violent grade in a girl aged about seventeen, he gave 40 drops of this tincture every four hours. On the third day after commencing with this remedy the disease was already nearly subdued; and by continuing its use in gradually augmented doses, perfect health was restored to the patient. A very remarkable case is related by Dr. K. Wood, in the seventh volume of the Medico-Chirurg. Transactions, which was cured by beating a drum during the paroxysms.

Dr. Young has reported some cases of this disease which yielded speedily to the use of the root of *actea racemosa* (cimicifuga racemosa). He gave a teaspoonful of the powdered root, three times daily. "This remedy, he says, appeared to arrest the progress of the disease almost at once. After using it only two days, one of the patients was visibly benefited, and was entirely cured in five days."¶

Electricity has also been recommended for the cure of chorea. De Haen states that he has known great benefit to result from the application of this agent; and Fothergill has published some remarks illustrative of its good effects in this disease.** Galvanism, also, has been recommended; and Richter asserts that *music* has sometimes produced astonishingly tranquilizing effects in this disease.

Sect. VI.—*Convulsive Affections of Infants.*

At no period of life are convulsions so apt to occur as during the age of infancy. With a nervous system peculiarly excitable, infants are subject to so many sources of permanent and transient irritation, that a very large portion of them suffer more or less from convulsive affections; and these constitute an alarming proportion in the catalogue of fatal infantile maladies. According to the statement by the late Dr. Clark, of Dublin, it appears that of 17,650 children born in the Dublin lying-in hospital, one-sixth part died during the first year; and of those who died, nineteen out of twenty perished by convulsions. This proportion of mortality from convulsions, however, very greatly exceeds that which a similar estimate drawn from private practice would yield. Still the frequency and fatality of this affection, under its various forms, are by no means inconsiderable in every rank of society, and under every variety of climate and external circumstances. Both the anatomical and physiological peculiarities of the infantile system are, indeed, such as to account for the especial aptitude to convulsive maladies during this tender period of life. The mind and body of an infant, not yet inured to the

* Observ. de Febrib., sect. ii.

† London Medical Repos., No. xxxiv. art. ii.

‡ Ausführliche Arzneimittellehre. Von Dr. Geo. Aug. Richter, b. ii. p. 589.

§ London Med. Repository, No. xlii. [In all distinctly periodical forms of chorea, the arseniate of potass is found to be efficacious. Certainly when the cutaneous function is impaired and the pulse is excited, it is appropriate. I have succeeded in several inveterate cases of this kind. In some instances, after due regulation of the secretions, I have used quinine and other preparations of bark with success. Their attendant anemia is soon overcome by chalybeates, improved diet, and exercise out of doors. Gymnastic exercises are particularly serviceable in the way of restoring the energy of the muscles. Mr. Braithwaite says that the remedy for chorea is the carbonate or sesquioxide of iron, especially when administered in any bitter infusion.—Mc.]

‖ Lond. Med. and Phys. Journ., xxxvi., Sept. and Oct. 1816.

¶ American Journ. of Med. Scien., vol. xii. p. 57.

** Philosophical Transactions for the year 1779.

impressions of internal and external causes, possess the most lively susceptibility to the various perturbating and exciting influences to which it is unceasingly subjected. "The muscles, during infancy, are pale, soft and fragile; their contractions quick, frequent and feeble; and the external surface of the body is endowed with a very high degree of sensibility. The circulation of the blood is very rapid, and the capillary system is peculiarly active. The lymphatic system exerts a more powerful influence upon the general economy of the infant than upon the adult. The nerves are large, in proportion to the size of the body, and resemble medullary pulps. Both the cerebral and ganglionic nerves are much more strongly developed in relation to the body than at any other period of life. The brain is large, and the nerves which proceed from it are of a very considerable size. The sensations of a child are quick and transient; slight impressions give rise to powerful effects; and when reaction takes place, it is strong and sudden, and coincides with the general mobility of the infantile system."*

Mr. North observes that the children of parents who marry either very early, or at an advanced age, are more liable to convulsive affections than the children of those who marry in the prime of life. I have met with very striking instances of aptitude to convulsions in several families, which accord entirely with this observation. It has also been said that convulsions are much more common in cities, and particularly in the higher and more luxurious classes of society, than among the laborious and less pampered inhabitants of the country. Of this, there can scarcely exist a doubt. The fresh and pure air of the country has an especial tendency to invigorate the infantile system, and to diminish nervous irritability, and thus to render the ordinary causes of convulsions less apt to excite such affections. It is, perhaps, mainly from the want of a pure and wholesome air in hospitals, that convulsive diseases are so much more common in these institutions than elsewhere. That the predisposition to convulsive affections is often hereditary, is amply demonstrated by observation. We occasionally meet with families in which the occurrence of repeated paroxysms of convulsions is almost a matter of course in all the children, as they successively pass through the process of primary dentition; and on the other hand, in very many families blessed with a numerous offspring, such affections never occur, although the ordinary exciting causes may be conspicuously present. The children of mothers endowed with a very susceptible physical and moral constitution—with a quick and active imagination, great sensitiveness and mobility of temper, are in general most apt to suffer convulsive affections. Observations have also been made in relation to the configuration and size of the head, as an indication of the natural aptitude to affections of this kind. It has been said, for instance, that children who have very large heads are more liable to convulsions than those who are less liberally furnished in this way. This observation, however, is, I believe, wholly without any foundation.

Exciting causes.—The exciting causes of convulsions are extremely various. In general, whatever is capable of causing strong sanguineous determinations to the brain, or of producing nervous irritation of the sensorium commune, may give rise to convulsive affections in children. The vascular turgescence of the brain, which in adults causes coma, or apoplexy, is apt, during the infantile period, to produce general convulsions. Even a moderate degree of sanguineous engorgement of the brain is frequently productive of convulsions in children predisposed to the affection. This is often illustrated by the occurrence of strong convulsions in fevers of strong vascular reaction, and particularly in the cold, and sometimes hot stages of intermittents. In very young children, the paroxysms of an ague are very often ushered in by convulsions. I have known instances in which paroxysms of convulsions occurred periodically for four or five days before the nature of the malady was understood.

In some instances, however, the disease arises from *cerebral* or nervous irrita-

* North on the Convulsive Affections of Children, p. 11.

tion, without any extraordinary sanguineous determination to the head; and these are, in general, the most serious and unmanageable cases. This cerebral irritation is usually purely sympathetic, depending on a primary local irritation seated either in the alimentary canal, or in some other part, more especially in the gums from dentition. It must be observed, nevertheless, that both intestinal irritation and dentition are very frequently attended with an increased determination of blood to the brain; and the latter especially is but very rarely unaccompanied by this additional source of cerebral disturbance.

When an attack of convulsions is preceded and attended with a flushed and turgid countenance, dilated pupils, a full and active, or a contracted, frequent and tense pulse, with strong beating of the arteries of the neck and temples, and a warm and dry skin, we have conclusive evidence that the cerebral irritation which causes the convulsions is mainly, if not wholly, produced by vascular turgescence in the brain. In such cases, the child generally remains in a lethargic state, for a longer or a shorter time after the subsidence of the convulsions. When, on the contrary, the countenance is pale and the pupils contracted, the skin cool or of the natural temperature, the pulse small, frequent, quick and irregular or feeble, we may infer that the attack is not dependent on sanguineous irritation of the brain, but the result of nervous irritation, transferred to the common sensorium, most probably from a primary nervous irritation, located in the intestinal canal.

Among the most common exciting causes of this affection are: *worms*, and various other irritating substances lodged in the alimentary canal, such as acid, indigestible articles of food, over-distension of the stomach, acrid intestinal secretions, &c. *Repelled cutaneous eruptions*, and suppressed discharges from ulcers or excoriations, particularly when seated behind the ears. *General plethora*, with a predisposition to irregular sanguineous determinations to the brain. *Dentition.*—Irritation from the latter cause is incomparably the most frequent source of convulsive affections during infancy. Convulsions not unfrequently occur in the acute exanthematous affections, either just before the eruption is about making its appearance, or in consequence of the sudden recession of the exantheme, before the period of its regular declension. Convulsions may also be excited by a direct or mechanical injury of the brain. I have known several instances, where a fall on the head, so as to cause considerable concussion of the brain, almost immediately gave rise to general convulsions, without any permanent or fatal lesion of the brain. Even severe local injuries of parts situated remote from the encephalon will sometimes excite an attack of convulsions.

In some cases, a slow and insidious vascular irritation will go on in the brain, with scarcely any decided symptoms of disease, until either an infusion of serum upon the surface or into the ventricles of the brain, or some other cerebral lesion, is effected. In cases of this kind, a paroxysm of convulsions is sometimes the first unequivocal intimation of the child's indisposition; and what was previously considered as mere fretfulness and general irritability of temper, of no serious import, now suddenly assumes the character of an almost hopeless form of cerebral disease. Cases of this kind, however, are almost invariably connected with more or less paralysis, and frequently with strabismus, and must be regarded rather as insidious instances of hydrocephalus or of cerebral inflammation, than as convulsions of the ordinary form, of which I am now speaking.

The *prognosis* of infantile convulsive affections must depend mainly on the nature of the exciting cause, and the violence and duration of the attack. Cases arising from a primary irritation located in the alimentary canal, or from the irritation of dentition, are, *cæteris paribus*, always less dangerous than instances depending on a primary irritation or lesion of the brain, or its spinal prolongation. Even purely sympathetic irritative convulsions, arising from intestinal or dental irritation, may terminate fatally, by the shock and structural lesion which the brain may receive from the violent determination of blood which in some instances takes place to the vessels of the encephalon. This is more particularly apt to be the case in children of a corpulent and very plethoric habit, and where

the convulsive attacks are of a protracted duration. In ordinary habits, there is but little to be apprehended from convulsions during infancy when the attacks are slight and of short duration; and this observation applies especially to those instances which, instead of leaving the infant in a dull and lethargic condition, are almost "immediately succeeded by the natural cheerfulness of the child." (North.) When death occurs suddenly during a paroxysm of convulsions, we almost always perceive manifest signs of strong sanguineous congestion in the vessels of the head—such as a darkish and turgid aspect of the face, fullness of the veins of the neck and head, heavy and almost stertorous breathing; and in such instances, the little patient dies "in a state nearly allied to apoplexy in the adult." The reviewer of Dr. North's excellent treatise on this affection, asserts that he has made more than thirty dissections of children who had died of convulsions, and that he invariably found the vessels of the encephalon strongly engorged with blood, attended with more or less serum in the ventricles of the brain; and, in several cases, "considerable extravasation of blood from a ruptured vessel" was detected.* When paralysis and squinting occur, the most serious cerebral lesion may be inferred, and the prognosis is, of course, of the most unfavorable kind. Convulsions that come on suddenly, without any premonitory symptoms, are, in general, much more apt to terminate favorably than those cases which supervene after a considerable period of slight indisposition—such as great fretfulness, starting from sleep, grinding the teeth, occasional flushes on one or both cheeks, a variable appetite, deranged state of the bowels, &c.

Before I go on to speak of the treatment of the convulsive affections of children, it will be necessary to give an account of a very singular form of spasmodic or convulsive disease, occurring in children during the period of lactation. This affection was, I believe, first distinctly noticed by Dr. John Clark, of Dublin, in his Commentaries. About sixteen years ago, an interesting paper was published by Dr. Kellie on this subject;† and at a subsequent period, Dr. James Johnson published some observations on the disease of a very interesting character.‡ The most satisfactory account of this remarkable form of convulsive disease that has as yet been given to the public is to be found in the treatise of Dr. North, already quoted in several places. Dr. James Johnson denominated this affection *carpo-pedal spasm;* others have designated it as a form of *cerebral spasmodic croup;* and Dr. North has treated of it under the head, *A spasmodic affection of the chest and larynx in young children, accompanied by general or partial convulsions.* The following are the phenomena and general course of this affection, as detailed by Dr. North, and in the interesting paper on this subject published by Dr. Kellie.

The disease generally occurs between the third and seventh month of age. It usually makes its approaches in a very gradual manner. At first the symptoms are often so slight, as scarcely to attract the attention of the persons about the infant. Among the earliest symptoms of the approach of the disease is a very peculiar hurried breathing, accompanied "by that kind of noise which an increased secretion of mucus in the air-passages would produce," occurring at the moment the child wakes from sleep. Frequently the child awakens, as in a fright, and is immediately affected with this agitated respiration, and rattling in the trachea. "If the little patient has previously enjoyed a good state of health, the characteristic rotundity of feature observable in infants quickly undergoes a remarkable change; the countenance becomes anxious, the sides of the nose are drawn in, the face is pallid and emaciated, the child frowns almost constantly, and *when put to the breast, it sucks greedily for a moment, but suddenly ceases to do so, throwing back the head with violence.*" The bowels always become constipated in the progress of the disease. These symptoms may recur, with more or less frequency, for a very considerable time, before any remarkable

* Medico-Chirurgical Review, July 1826, p. 157.

† Edinburgh Med. Journal, vol. xii.

‡ Med.-Chir. Journal, vol. iii. 1817.

change takes place, indicative of a further development of the affection. "A convulsive motion of the hand is usually the next morbid sign which excites attention. The child's thumbs will be found constantly and firmly pressed upon the palm of the hand; the wrists and ankle joints are bent rigidly inwards; the head is often thrown backwards, by which the anterior muscles of the neck are kept painfully upon the stretch. The inconvenience at the moment of waking is not now a mere acceleration of breathing. The symptom still continues in an aggravated degree—but the noise accompanying the respiration has gradually assumed a very different character from that which at first marked it. Each inspiration is now attended by *a loud crouping noise*, which may be heard in an adjoining apartment; the chest and larynx appear to be painfully constricted; the heart palpitates violently; the child sobs, but never cries in its natural manner during these paroxysms of suffering. So great is the difficulty of breathing, that it sometimes appears to be almost totally suspended for a few seconds. The countenance is then pale, as in syncope. Sometimes, though rarely, the face is dark, and the vessels of the head and neck turgid, as in apoplexy. As the disease advances, the little patient experiences more or less frequent attacks of general convulsions, during which the features are much distorted: and the whole body is occasionally implicated in the convulsive movements. In a child, in whom the convulsions were very frequent and severe, the state of opisthotonos was so complete, that for many days the head and heels were the only parts which touched the bed; and if, with difficulty, this apparently painful position was altered by the mother, it was quickly resumed. In the majority of cases, no sustained febrile action is to be detected, nor is there usually any indication of particular determination of blood to the head."* Sometimes, the locked state of the thumbs, rigidly bent position of the hand and foot, and stridulous or croupy respiration, will continue several weeks with scarcely any intermission, though irregular intervals of remission and exacerbation are always more or less conspicuously noticed. "The child sometimes appears lively for a short period, and the countenance may be animated by a momentary gleam of cheerfulness; but it almost invariably awakens from its slumbers, however tranquil they may sometimes appear, with a convulsive paroxysm similar to that described above." After the termination of a paroxysm, the child appears to be greatly exhausted, and with scarcely the power of voluntary motion for some time. Dr. Kellie's description of this affection is somewhat different from the one just given from Dr. North's work; but in the main and characteristic phenomena, they coincide sufficiently to enable any one to refer it to one and the same form of infantile disease. "On the anconal aspect of the metacarpus of the hand," says Dr. Kellie, "and on the rotular aspect of the metatarsus of the foot, a remarkable tumor occurs, having a considerable degree of roundness and elevation, resembling that sort of swelling which might arise on the same parts from a blow or contusion. It seems to rise suddenly, and when first observed, it has somewhat of a mottled livid and purplish color, resembling the chilled hand of a full and healthy child after exposure to a cold and frosty atmosphere. It has no inflammatory heat, and does not appear to be morbidly sensible, or to give any pain to the child when handled; nor does it pit on pressure, but rather gives the sensation of firmness and resistance. When an attempt is made to move it sideways, under the skin, it conveys the notion of a disease peculiar to infants, known by the name of *skin-bound*. These tumors terminate abruptly at the carpus and tarsus, so that in lusty children it seems, in these places, as if confined by a cord or bandage. They sometimes continue for two or three weeks; occasionally they disappear in a few days; and in other instances, they disappear and reappear at short intervals. The tumor sometimes becomes leucophlegmatic, loose, with considerable œdema spreading upwards on the legs. This, however, never occurs unless the swelling continues for several weeks without abatement; but

* North, loc. citat., p. 259.

its more sudden disappearance without undergoing these changes, or without passing into a state of leucophlegmasia, is by far more common. This swelling on the tops of the hands and feet is connected, in a great proportion of cases, with *a spastic contraction of the flexor muscles* of the thumbs in the upper, and the toes in the lower extremities. The thumb becomes rigidly contracted, and permanently bent downwards and laid flat upon the palm of the hand; and, in like manner, the toes are bent down to the plantar aspect of the foot. Along with the thumb, the carpus is also, in some cases, drawn inwards by a spastic contraction of its flexors.*

In Dr. James Johnson's case,† the child (nineteen months old) was seized three or four times in the hour, "with spasmodic affections of the respiratory muscles, consisting of repeated attempts to fill the chest, during which she threw herself back, as in opisthotonos, and appeared as though she would be suffocated. These fits would last ten or twelve minutes, after which, the child was somewhat easier, but always fretful and peevish. The backs of the hands and insteps were swollen and hard; the thumbs rigidly contracted, and locked across the palms of the hands; the toes were bent down towards the soles of the feet; and both wrists and ankles were firmly bent by the contraction of the flexor muscles. The bowels were torpid; the stools clayed or slimy and offensive; and the child was extremely irritable both by day and by night." During the preceding summer, I met with an instance of this affection, in a child about nine months old, in other respects of a remarkably vigorous and robust state of health. The symptoms of this case coincided so closely with those mentioned in Dr. Johnson's case, that his description applies in every point to its phenomena and course.

It does not appear that this singular affection is attended with much danger, when timely aid is afforded with proper remedial means. Dr. North had seen but one fatal instance of this malady; and Dr. Johnson states, that in his own practice no instance of death has occurred from it. The case which came under my own observation, terminated favorably, after the process of primary dentition was completed. It should, nevertheless, be regarded as a disease of an unfavorable tendency; for it cannot be doubted that the cerebral irritation which gives rise to its characteristic phenomena, may, under certain states of predisposition, and in co-operation with other causes, tending to encephalic disease, readily pass into a state of vascular irritation, or sub-inflammatory action in the brain, or its meninges, and thus ultimately give rise to fatal effusion, or lesion in the brain, or its spinal prolongation.

In the only dissection which is reported by Dr. North, the traces of cerebral disorder were sufficiently conspicuous. The vessels of the brain were very turgid; a small portion of blood was effused under the dura mater in several parts; a small quantity of serum was found in the ventricles; and the whole mass of the cerebrum was unusually firm, while the cerebellum was softer than common. The thorax was not examined. Dr. North ascribes the inordinate determination to the head, and the evidences of encephalic disorder presented on dissection, in this case, to an accidental and overwhelming "rush of blood to the head, caused by a very passionate fit of crying," just before the occurrence of the last and fatal paroxysm. He thinks the characteristic phenomena of the disease are entirely independent of *cerebral* derangement, and that "in the majority of cases, there is no evidence of affection of the brain," and that we have no right to assume that certain individual symptoms—such as the crouping noise or bent thumb, must *necessarily* be followed by affection of the brain.

From a general view of the phenomena of the malady, it appears to me, nevertheless, highly probable, that the disease is *ab initio*, and essentially connected with nervous irritation of the sensorium, propagated at last, in very violent cases, to the spinal cord. The frowning aspect of the countenance—the starting from sleep—the peevish and fretful temper—the occasional flushing of one cheek

* Dr. Kellie, loc. citat.

† Med.-Chir. Journ., May 1817, pp. 448, 449.

mentioned by Kellie, the costiveness and hepatic torpor, &c.. all seem to indicate a state of nervous irritation or erethism of the brain; and the opisthotonic spasms, which are wont to supervene in aggravated cases, point very directly to irritation of the spinal cord.

Whatever may be thought as to the proximate cause of this affection, all writers on this subject agree in ascribing its origin to dental irritation. It seems to be much more apt to occur in children of a robust and full habit of body than in such as are of an opposite constitution. So far as I have been able to ascertain, the disease has never been observed to occur except during the actual progress of primary dentition; and where it does not terminate fatally, at an earlier period, it always subsides soon after the completion of this process.

Treatment.—The chief indications to be attended to in the treatment of the affections under consideration, are: to obviate the influence of the remote irritating cause; to allay the nervous or cerebral irritation upon which the convulsive phenomena immediately depend; and to protect the brain from too powerful a determination of blood to, and congestion of, its vessels.

Where there is reason to believe, from the swollen and irritated state of the gums, the dental irritation is the exciting or accessory cause of the convulsive attack, the gums should be divided down to the advancing tooth. This measure is particularly important in the "*carpo-pedal*" form of convulsions, mentioned above; as it appears invariably to be a consequence of irritation from this source. If, on the other hand, it should appear that gastro-intestinal irritation is the exciting cause of the disease, whether from crude or indigestible ingesta, acrid secretions, or worms, immediate steps should be taken to remove the offending cause. If the child has received any unusual food, of difficult digestion, into the stomach, a few hours before the occurrence of the convulsions, it will be proper to administer a full dose of ipecacuanha, with the view of exciting free vomiting.* Before resorting to this remedy, however, it is necessary to apply the means, presently to be mentioned, calculated to derive the circulation from the head, and to protect the brain from the effects of strong vascular engorgement. I have lately seen an instance of violent convulsions, which continued until spontaneous vomiting brought off a large quantity of raisins, with which the child had been suffered to gorge its stomach. To remove the irritating matters that may be lodged in the bowels, purgative enemata, and if the child can be induced to swallow, infusion of senna and spigelia may be advantageously resorted to. In all instances, indeed, purgative injections are appropriate, on account of their revulsive tendency; and whatever other measures are adopted, these, if the necessary means are at hand, should not be neglected.

Blood-letting, though not always applicable, is, in some instances, a very important auxiliary in the management of these affections. A principal object in the treatment of convulsions, is to proteet the brain from fatal oppression; and for this purpose bleeding is one of our most efficient means. Where the signs of strong determination to the head are manifest, and especially in robust and plethoric children, blood should be promptly abstracted. On the contrary, however, it will be prudent to abstain from this evacuation in patients of a weak and relaxed habit, and where the ordinary evidences of vascular engorgement are absent. With regard to *local* bleeding, by *leeches* to the head, my own experience accords entirely with the following observations of Dr. North: "I have never seen well marked symptoms of determination to the head in children removed by leeches, however freely they were applied. Their application never fails to annoy the little patient considerably, and their effect is not to be relied on." If it be deemed necessary to draw blood directly from the vessels of the head, this

* [This is by far the most important indication to fulfil, and should never be neglected. I attended a little boy a few weeks ago who had fallen into frightful convulsions, after undergoing a surgical operation, and when every other remedy had failed, the rejection of a piece of orange peel he had taken many hours before, was followed by immediate relief.—Mc.]

writer recommends bleeding from the jugular vein, or by cupping upon the temples or behind the ears. In cases where the little patient sinks into a state of coma, with flushed countenance, throbbing of the carotids, &c., after an attack of convulsion, local depletion, in any of these latter modes, is sometimes indispensable to the safety of the patient's life.

Some practitioners are in the habit of giving large and repeated doses of calomel, in the convulsions of infants, under an idea that there is something peculily beneficial in the operation of this article in affections of this kind. Dr. North objects strongly to this practice, as tending in no small degree to injure the constitutions of children. That calomel is too heedlessly and indiscriminately given in the affections of children, particularly in the United States, I have not the smallest doubt. I am quite certain that I have seen instances where this practice was the cause of great and irreparable constitutional injury. Nevertheless, it has appeared to me, that one or two active doses of this article, so as to cause free alvine evacuations, is capable of procuring more advantage, in general, in the convulsions of infants, than any of the other usual means for evacuating the alimentary canal.

Revulsive applications, with the view of equalizing the nervous excitement, and deriving the circulation from the encephalon, are always proper, and often promptly sufficient in moderating or arresting the convulsions. *Warm pediluvium*, the water being as warm as can be borne without injuring the skin, is one of the most beneficial of this class of remedies. This measure is particularly apt to afford relief in convulsions excited by the irritation of dentition. The good effects of very warm applications to the feet are much enhanced by cold applications to the head. While the feet and legs are immersed in warm water, a piece of flannel, wet with cold water, should be applied over the head and temples. These measures are especially important in cases attended with symptoms of sanguineous congestion in the head, and cannot be omitted without losing one of our most efficient remedies in such affections. Not unfrequently, these applications are alone sufficient to put a speedy termination to sympathetic convulsions. Where the determination to the head is very great and persistent, it will be proper to apply pounded ice in a bladder to the scalp, while applications of warm water or sinapisms are made to the feet. Some writers recommend putting the patient into a warm bath, while the cold applications are made to the head; but I suspect that, at most, warm semicupium will in general exert a better revulsive effect than immersion of the whole body. Dr. North observes, that for many years he has "directed the practice of immersing the child's lower extremities in a warm bath; while cold water is poured, in a gentle stream, on the head of the cervical spine." While these applications are being made "the countenance and pulse should be attentively watched. When paleness and collapse of the face supervene, and the pulse declines or intermits, the cold applications should be suspended, and the head and trunk covered with a dry cloth; but as soon as signs of reaction return, the process is to be resumed even to the third or fourth time, till its good effects shall be decisive and manifest in the suppression of all convulsive motions." (North.)

The operation of blisters is in general too slow to admit of useful applications in the ordinary cases of infantile convulsions. Nevertheless, where there is reason to apprehend a repetition of the attacks, small blisters laid behind the ears, or on the back of the neck, are in general decidedly beneficial. Vesication on this part is particularly calculated to afford advantage in those cases which supervene on the drying up of superficial and discharging ulcerations behind the ears. Some benefit may also be expected from the application of blisters to the inferior extremities, as counter-irritants. Dr. North, whose authority upon this subject deserves much respect, says, "that in many instances where there was evident determination to the head, *without any general excitement*, he has obtained the best effects from blisters to the calves of the legs, or between the shoulders." The application of blisters to the *head*, in any of the inflammatory

or congestive affections of the brain, is very rarely attended with advantage; and in many cases appears rather to augment than relieve the evil. In hydrocephalus, I have never known even the slighest temporary advantage from vesication of the scalp. It is, nevertheless, not improbable, that in sympathetic convulsions, some benefit might accrue from counter-irritation on the scalp; though my experience furnishes me with no facts in confirmation of the usefulness of this practice.

Rubefacient frictions along the course of the spine, is a practice I resort to in most instances of protracted convulsions, and in some cases manifest benefit appeared to me to result from it. When the convulsions assume a tetanic character—the body remaining for some time rigidly bent backward—leeching, and sinapisms over the spinal region would seem to be more especially indicated.

Formerly, physicians were much in the habit of exhibiting anti-spasmodics in infantile convulsions—such as assafœtida, camphor, valerian, musk, and ol. succini. In children of a very nervous or irritable habit, some benefit may occasionally be derived, during the fit, from assafœtida, musk, or the oil of amber, provided no signs of determination to the head be present. Upon the whole, however, these are, under the most favorable circumstances, of very equivocal propriety; and they are decidedly improper, where the arterial reaction is considerable, and the vessels of the head engorged. *Opium* is a remedy that may either do very serious mischief, or no small degree of good, according to the particular states of the system and the character of the attending circumstances of the case. In instances attended with cerebral erethism, or encephalic vascular congestion, nothing, perhaps, would be more likely to do harm than opium, more especially in robust and full habits. In general, it may be said, that whatever local or general depletion is indicated, opiates are to be avoided. On the contrary, however, where convulsions arise sympathetically, in consequence of some remote and fixed irritation, as in the alimentary canal, and the habit of the patient is irritable, relaxed and feeble, opium, judiciously administered, may afford decided benefit. It is, indeed, *anceps remedium;* but the practitioner who has learned to discriminate between the circumstances that indicate or contra-indicate the propriety of its use, will often find it a most valuable auxiliary. In general, it is altogether inadmissible in convulsions arising from the irritation of dentition; and in cases depending on causes seated within the head, it is, if possible, still more inappropriate. When the primary irritation is located in the alimentary canal, we may, under the other favorable circumstances just mentioned, employ small doses of Dover's powder, repeated according to the exigencies of the case, with manifest advantage. Opiate embrocations over the chest and spinal region will also, in such cases, afford benefit. These are particularly useful where, from great nervous irritability, there is a strong tendency to convulsive attacks, unaccompanied with general vascular irritation.

When convulsions arise from repelled chronic cutaneous affections, we must endeavor to prevent their recurrence by the use of the warm bath, frequent dry frictions, and sulphur given internally. Setons and issues may also aid us in such cases.

The *treatment proper* in the *carpo-pedal* form of convulsions, embraces the employment of general and local bleeding; laxatives; small doses of calomel, to correct the functions of the liver; cold applications to the head; rubefacient and anodyne embrocations along the track of the spine; warm bath and pediluvium; a strict attention to the state of the gums; and the avoidance of everything calculated to cause unusual excitement of the system.

Sect. VII.—*Hysteria.*

In relation to the diversity and variableness of its phenomena, hysteria is truly a "protean disease." It is essentially a dynamic affection of the *nervous system*,

manifesting itself by morbid phenomena in every sensitive and irritable part of the system, in the voluntary and involuntary muscular systems, in the sensorial organs, the brain, the intellectual faculties, the digestive apparatus, the various glandular viscera; in short, it presents, in its multifarious symptoms, every morbid sympathy, perhaps, of which the animal system is susceptible.

Hysteria may be divided into three modifications, namely, 1, *chronic or habitual hysteria;* 2, *paroxysmal or convulsive hysteria;* and 3, *hysteric insensibility or stupor*, without spasms of the voluntary muscles.

1. Chronic or habitual hysteria occurs in weak, delicate and irritable habits, particularly in such as are affected with profuse leucorrhœa, or suffer frequent menorrhagic discharges. Females affected with this form of the disease are usually called *nervous*. They are almost always complaining of some unpleasant or painful sensations; their temper is variable, often fretful, sometimes animated, talkative, and anon peevish and gloomy; they pass often rapidly from laughing to crying, from gayety to melancholy, from despondency to hope, and vice versa, from the most trifling causes. They often complain of various distressing sensations in the abdomen, head or chest. Flatulency, a rumbling noise in the bowels, severe colic pains, a sense of weight and bearing down in the region of the uterus, pain in the neck of the bladder, dysury, a feeling of emptiness, or of fullness and tension in the pit of the stomach, variable appetite, slow digestion, eructations, occasional spells of great anxiety and alarm, palpitation, weakness and syncope, or a sense of sinking in the præcordia, ringing in the ears, confusion of mind, transient pains in various parts of the body, and the sensation of a ball rising in the throat to the top of the sternum, causing oppressed and hurried respiration, and a feeling of impending suffocation, (*globus hystericus*,) are among the most common symptoms of this modification of the disease. A peculiar numbness, or feeling as if insects were creeping on the top of the head, is sometimes experienced; and a violent circumscribed pain, often not above an inch in circumference, is a frequent affection in this form of the disease. Many females affected with chronic hysteria frequently experience a troublesome pain confined to a small space just below the left breast; and others suffer much inconvenience from a deep-seated circumscribed pain in the left iliac region.

Patients laboring under this form of constitutional hysteria seldom become affected with *convulsions*. The ordinary exciting causes of the hysteric paroxysm are much more apt to produce in them syncope, insensibility, or temporary mental derangement, or spasmodic and very painful affections of the alimentary canal, dyspnœa, and *globus hystericus*, than distinct convulsions.

2. The hysteric paroxysm usually comes on suddenly. Sometimes the fit consists in violent and convulsive laughing, alternating with crying and screaming; or attended with mental alienation; rapid and incoherent talking; singing; suffocative spasms of the throat; a wild and furious expression of the countenance; raving; gnashing of the teeth; tearing out the hair; beating the breast with the hands, biting, &c. Occasionally these symptoms subside without terminating in convulsions. More commonly, however, convulsions, of terrific violence, speedily supervene. The spasms usually partake more of the tonic or tetanic character, than of the clonic or strictly convulsive form. The body is rigidly bent backwards, or variously and most powerfully contorted; the breast projected forwards, and the head drawn backwards; the face swollen; the tongue protruded, or the jaws firmly closed; the eyes rolling, prominent and red; the teeth gnashed; the fists clenched; the arms spasmodically thrown about, and the abdominal muscles violently contracted; in short, the whole muscular system is thrown into such violent spasms, that scarcely any attempt of the bystanders is sufficient to restrain the contortions, or prevent the patient from being thrown out of bed. When the paroxysm ceases, the patient is left in an exhausted, and stupid or somnolent condition, which in the course of an hour or two passes off, without leaving any other affections than a feeling of general soreness, and a slight pain or uneasiness in the head and pit of the stomach. This form of hys-

teria does not often occur in very weak and delicate individuals, habitually laboring under the former variety of hysteric symptoms. It is more commonly met with in sanguineous, plethoric, and robust females, of strong passions; and occurs usually as the immediate consequence of some disagreeable mental emotion, or the sudden suppression of the catamenial discharge.

In plethoric and irritable habits the hysteric attack occasionally seizes chiefly on the heart and arteries, giving rise to what the older pathologists called *turgescentia nervosa.** The face becomes flushed and turgid; the heart palpitates violently; the pulse beats tumultuously; the carotids throb; the patient complains of headache, becomes slightly delirious, and often experiences transient pains in the side, with hurried and anxious respiration.

In some instances, the paroxysm assumes the phenomena of violent asthma, with a highly excited state of the vascular system. Sometimes the disease assumes the form of severe cholera, with extreme gastric pain, and continued retching or vomiting.

3. In some instances, the patient, without any previous spasmodic affections, sinks into a state of complete insensibility. She lies on her back, with the extremities extended and relaxed, the eyes closed, the teeth firmly locked, and the breathing slow and intermitting, but without being laborious or audible; the pulse is generally regular, slow, and small; the countenance natural or pallid; the extremities cool; and the sensorial functions and power of swallowing appear to be entirely suspended. Occasionally a deep and long inspiration is made; and the patient is apt, when some degree of sensibility returns, to tear the clothes from her bosom, or to press upon it with both her hands. Sometimes young females will continue in this state for many hours. I have known it to last a whole day; at others the paroxysm is transient. It generally passes off rather suddenly. The patient awakes, as it were, from a deep sleep, suddenly raises herself into a sitting posture, looks about with an air of surprise, and speedily recovers the entire possession of her mental and corporeal powers. During this state of hysteric stupor, the urine is almost always retained, or perhaps suppressed, and soon after its subsidence a large quantity of a pale or watery appearance is commonly discharged.

This modification of the hysteric paroxysm is most apt to occur in young unmarried females, from sudden suppression of the menses, or as a consequence of violent mental emotions—and perhaps still more commonly from taking heavy and indigestible food during the catamenial period.

Pathology.—Hysteria, though not exclusively, is chiefly confined to females. It never occurs during childhood, and its appearance in the form of convulsions or distinct paroxysms in old age, is almost equally uncommon. The range of its sway is almost entirely confined to the period which intervenes between the commencement and the complete cessation of the uterine functions. It is particularly apt to occur, in its less violent forms, at the latter critical epoch of female life; and paroxysmal or convulsive hysteria occurs often shortly before and after the first appearance of the catamenia.

There is, therefore, something peculiar in the female organization, which renders them so especially the subjects of this remarkable affection; something, we may presume, distinct from mere delicacy of structure and nervous irritability; for, although men of nervous temperament and weak and irritable habits may occasionally suffer some of the lighter symptoms of hysteria, they very rarely, if ever, so far as I know, become affected with the true hysteric paroxysm. Let us advert, then, to the circumstance, that the susceptibility for this disease commences only with the development of the proper uterine or sexual functions, and again diminishes, and finally ceases, with the entire cessation of these functions—that, in short, the period of life during which the *uterus* maintains its influence or sympathies in the female system, is that period also to which the occurrence of

* Richter, loc. cit., vol. vii. p. 445.

hysteria is almost exclusively confined, and we are led to the conclusion, that, in some way or other, the female generative organs have an intimate concern in the production of this affection.

From these and other analogous circumstances, it has been inferred that the proximate cause of hysteria is located in the uterus—a doctrine which is indeed expressly implied in the *name* given to this affection. Hippocrates, Zacutus Lusitanus, Fr. Hoffman,* Rave, Salmuth, and more recently Villermay, entertained this view of the pathology of hysteria; and Richter observes, that the generative system is "*very frequently*" the point whence the morbid sympathies which give rise to the hysteric phenomena, radiate; and that in such cases, the disease may, in certain respects, be regarded as proceeding from the sexual organs.†

The general opinion at present, however, is that the brain, and not the uterus, is the essential seat of hysteria; and there can be no doubt, indeed, that the convulsive form at least, as well as many other morbid phenomena manifested by the disease, are directly dependent on cerebral irritation. It appears, nevertheless, highly probable, also, that many symptoms belonging to this affection are the immediate result of an irritation located in the ganglionic system of nerves, exclusive, perhaps, of any direct dependence on cerebral reaction. Hysteria is emphatically a *nervous* affection. Its fundamental condition would appear to consist in an extremely sensitive and excitable state of the whole nervous system, and a consequent inordinate activity of the various organic sympathies. We may presume, that if, in a system thus constituted, an irritation occurs in *any part* of the body, it will be rapidly transferred, either to the organs which maintain the closest sympathetic relation with the part primarily irritated, and give rise in them to local pain, or spasm, or uneasiness; or to the brain, causing disturbance of the intellectual or sensorial functions, and being thence reflected upon the muscles and other parts, exciting spasms, pain, and convulsions.

Mr. Tate, in a small work on hysteria lately published, endeavors to prove that the proximate irritation on which the phenomena of hysteria depend, is located in the spinal marrow. He asserts, that in the majority of cases of this disease, whether of a paroxysmal or chronic character, considerable tenderness will be found to exist in some part of the spinal column, and in some cases, the soreness to pressure is very great. The application of a tartar emetic plaster over the part of the spine which is morbidly tender, very rarely fails, he says, to remove the disease, however violent it may be, or long it may have continued.‡

Causes.—The *predisposition* to hysteria depends sometimes on a peculiar constitutional habit, and in some instances, is manifestly hereditary. Girls of a delicate and relaxed habit of body, light hair, blue eyes, a fair skin, and sanguineous habit, with precocious intellect, animated dispositions, lively fancy, and early sexual development, are in general most liable to hysteric affections in after-life. Very generally, however, the predisposition to hysteria is *acquired* from the influence of causes that tend to produce plethora, nervous irritability, and general relaxation. This affection is, comparatively speaking, not often met with in individuals inured to an active or laborious course of life, or accustomed to a plain and regular mode of living. Like gout, it is much more commonly encountered in the mansions of the rich and luxurious than in the hovels of the poor and laborious. Indolence, sedentary habits, a pampered and luxurious mode of living, the too early and overstrained exercise of the mind, the habitual excitement of the imagination, and of the moral sympathies, by the perusal of high-wrought descriptions of affecting incidents, or of circumstances calculated to awaken and keep alive agitating emotions, are among the most common and influential causes of the nervous or hysteric predisposition. The depressing

* Med. Rationel. Systema., tom. iv. p. 161.
† Specielle Thérapie, bd. vii. p. 451.
‡ A Treatise on Hysteria, &c. &c. By George Tate, Surgeon, &c. London, 1831.

passions, also, have a powerful tendency to predispose to, as well as to excite, hysteric affections.

The *exciting causes* of hysteria are exceedingly various. They may, however, be arranged under the following heads:*

1. *Those which act immediately upon the sensorium commune.*—Violent anger, terror, grief, jealousy, remorse, envy, disappointed ambition, prostrated hope, hatred, loss of reputation, unfortunate love, mortified pride, opposed desires, in short, whatever strongly agitates or affects the mind, may excite hysteric symptoms. Under this head we must also place the production of the disease by the sight of persons laboring under the hysteric paroxysms. Osiander relates some very remarkable instances of this kind;† and cases excited in this way are mentioned by Tissot,‡ Whytt, Rowley,§ Reil, and others.

2. *Disagreeable impressions on the organs of sense, depending generally upon idiosyncrasy.*—Richter states, that acute and melting tones, particularly those produced by the *harmonica*, have often suddenly excited hysteric affections. Disagreeable odors, also, sometimes produce this effect; and the same consequence has been known to result from certain impressions received through the sense of touch.

3. *Irritating substances lodged within the alimentary canal.*—In persons predisposed to hysteria, indigestible and irritating articles of food are particularly apt to excite hysteric affections. This is one of the most abundant sources of those habitual hysterical complaints so frequently met with in females of nervous temperaments and weak digestive powers. Intestinal irritation from wind, acrid secretions, or worms, may also give rise to this affection.

4. *Suppressed evacuations.*—The sudden suppression of the catamenial discharge during its flow, often gives rise to extremely violent paroxyms of hysteria. The remote cause, in instances of this kind, is usually *cold*—particularly the application of cold to the feet while the menses are flowing, or just about making their appearance. Authors mention, also, suppressed perspiration and hæmorrhoidal discharge among the exciting causes of this disease; and repelled chronic cutaneous eruptions are said, occasionally, to give rise to hysteric affections.

5. *Excessive evacuations.*—Inordinate sanguineous or serous discharges may, perhaps, more frequently act as predisposing than exciting causes of hysteria. Be this as it may, it is certain that females who are affected with profuse leucorrhœa, or frequent menorrhagia, are peculiarly liable to hysteric complaints. Excessive hæmorrhoidal evacuations, chronic diarrhœa, profuse lochia, and nursing infants too long at the breast, appear to be particularly favorable to the occurrence of various nervous affections.

6. *Causes that tend to augment the sensibility and to produce an habitual erethism of the sexual organs*, have, without doubt, a powerful influence in the production of hysteria.‖ The frequent excitation of voluptuous feeling by improper reading, conversation, pictures, or the workings of an unchastened and active imagination, &c., are, I apprehend, not unfrequently deeply concerned in the causation of this affection. Where the sexual propensity is early developed, and supported by influences of this kind, and its gratification firmly resisted by moral restraints, or unsatisfied from less praiseworthy motives, hysteric paroxysms are particularly apt to occur. Hence, perhaps, the occasional removal of the hysteric diathesis in young females by marriage.

Diagnosis.—Many eminent pathologists have regarded hysteria and hypochondriasis as essentially the same affection.¶ The general opinion at present,

* Richter, loc. cit., bd. vii. p. 456.
† Entwickelungs Krankheiten, vol. i.
‡ On the Diseases of the Nervous System, vol. ii.
§ On the Diseases of Females.
‖ Richter, loc. cit., bd. vii. p. 460.
¶ Stahl, Sydenham, Whytt, Tissot, Van Swieten, Selle, K. Sprengel, Henke, and Zimmerman, were of this opinion.

however, is that they are distinct diseases; and this is unquestionably the correct view of the case. The following are the prominent distinguishing characters of these affections:

1. Hysteria occurs chiefly in individuals of nervous, irritable, and plethoric habits, of great mental and corporeal excitability, quick perception, rapid transitions of disposition and temper. Hypochondriasis, on the other hand, very generally attacks persons of sluggish, melancholic temperaments, unirritable fibre, addicted to deep and fixed reflection, musing, and reverie.

2. Hypochondriasis is not so variable in its phenomena, and more protracted in its course, with less manifest remissions and exacerbations than hysteria.

3. Hysteria generally comes on and goes off suddenly, and is attended with an increased excitability of the nervous system, and with various painful and spasmodic affections. Hypochondriasis almost always approaches slowly, without spasm or distinct pain, and gradually increases in violence, and again goes off in the same gradual manner.

4. In hypochondriasis, the primary irritation is much more distinctly seated in the abdominal viscera; the digestive and hepatic functions are more prominently and permanently affected than in hysteria.

5. In hypochondriasis the mind is, as it were, paralyzed—fixed with steadfastness upon some engrossing subject. In hysteria the intellectual powers are versatile; often active, and sometimes wildly confused. Hysterical patients experience more corporeal sufferings; hypochondriacs more of mental distress. The former are more occupied with present complaints; the latter look into futurity with distressing and gloomy forebodings of distant evil. The hypochondriac feels himself an insulated, deserted, and doomed being—loses his sympathies for the world—even his natural propensities and passions are absorbed by the ruling idea. The hysteric patient, on the contrary, is often agitated by various emotions and feelings; he loves, hates, cries, laughs, hopes, fears, is garrulous or taciturn, in rapid succession, and often apparently without any adequate causes.

Treatment.—Treatment proper in convulsive or paroxysmal hysteria.—The principal indications in the treatment of hysteric convulsions are:—1. To obviate inordinate sanguineous congestion in the head, by depletory and revulsive applications; 2. To allay the morbid excitement in the nervous system, by anodyne and antispasmodic remedies; and 3. To remove, as much as may be in our power, the local irritating causes upon which the irregular determinations and morbid actions both of the nervous and sanguiferous systems depend.

It has already been observed, that strong sanguiferous determination to the head perhaps always occurs in the hysteric paroxysm. The suffused and turgid face, projecting and blood-shot eyes, distension of the jugulars, and throbbing of the carotid and temporal arteries, so generally noticed during a fit of hysteric convulsions, are sufficient evidences of a highly congested state of the encephalon. If, in addition to the signs of inordinate sanguineous determination to the head just mentioned, the pulse be active, full or tense, or the general habit of the patient manifestly plethoric, bleeding to an extent sufficient to make an evident impression on the pulse should be immediately practised. This is not only a proper precautionary measure for obviating any serious consequences that may result from the strong vascular turgescence within the head, but it is also decidedly beneficial as a preparatory step to the employment of other remedies.* This evacuation is especially useful in cases that occur in young and sanguineous females, from the sudden suppression of the catamenial discharge. In instances of this kind an efficient blood-letting rarely fails to moderate the symptoms very speedily, and, occasionally, to induce a complete intermission of the spasmodic actions. With the view of equalizing the circulation and nervous

* Dr. Dewees, Treatise on the Diseases of Females, p. 486.

excitement, *sinapisms* to the inferior extremities, or, if practicable, *warm pediluvia* may also be very beneficially applied.

In prescribing internal remedies in the hysteric paroxysm, it is of much consequence to pay particular attention to the nature of the exciting cause. When the paroxysm is the immediate consequence of gastric irritation from indigestible or irritating articles of food, an emetic should be immediately administered, and vomiting excited as speedily as possible.* I have frequently administered the *sulphate of zinc* in such cases with the happiest effect. The usual antispasmodics will do little or no good in instances arising from causes of this kind; and it is therefore particularly necessary, on being called to such cases, to inquire into the nature of the ingesta or diet taken previous to the occurrence of the paroxysm. In some instances depending on gastric irritation, the convulsions alternate with violent retching, attended usually with excruciating pains in the stomach. When this happens, vomiting should be encouraged by copious draughts of tepid water, or by moderate doses of ipecacuanha. As soon as the offending contents of the stomach are entirely thrown off, a *full dose* of laudanum should be administered, provided no symptoms of strong cephalic congestion be present.

When the hysteric paroxysm is excited by mental emotions, narcotic and antispasmodic remedies are appropriate means. Laudanum, assafœtida, musk, sulphuric ether and castor, may be employed for this purpose. *Laudanum* is particularly valuable in hysteric affections resulting from moral causes. It may be given by itself, or, perhaps, more advantageously, in union with ether or assafœtida, according to the following formula.†

It is sometimes impossible to introduce any medicines into the stomach during the hysteric paroxysm. When this is the case, antispasmodic and anodyne enemata ought to be resorted to. From twenty to thirty grains of assafœtida, dissolved in six or eight ounces of water, with the addition of a teaspoonful of laudanum, may be thrown into the rectum.

In those violent paroxysms of hysteria which sometimes occur in consequence of the menses becoming suddenly arrested during their flow, from the application of cold to the feet, bleeding, sinapisms to the ankles, warm pediluvia, and particularly *turpentine enemata*, with the internal use of assafœtida, are particularly applicable. In an extremely violent case of this kind, in a young and unmarried woman, I lately administered about half an ounce of the tincture of *secale cornutum*, with prompt and very decided benefit. In ten minutes after this article was swallowed, the convulsive symptoms were entirely allayed. In very obstinate and protracted instances of this character, I have known great advantage to result from turpentine injections.‡

My usual practice has been to repeat the terebinthinate injections until the bowels are well evacuated; and, when this is effected, to throw about two drachms of turpentine, mixed with a drachm of laudanum and a small portion of milk, into the rectum.

* [This is, according to my experience, the most common exciting cause of the hysteric paroxysm. At all events I always begin with the administration of large quantities of warm water, and if that does not excite vomiting, I give mustard infusions. In cases where the mouth is spasmodically closed, I bind the limbs with strong ligatures for a few minutes, and seize the first opportunity to force down an emetic. As long as the stomach continues to be oppressed by undigested matters, it will prove impossible to relieve by the use of antispasmodics or stimuli. —Mc.]

† ℞.—Tinct. opii ℥ss.
Æther sulph. ʒii.—M. S. From forty to eighty drops, and repeated according to its effects on the system.

℞.—Tinct. opii ʒii.
—— assafœtid. ℥i.—M. S. A dessert spoonful every half hour until the symptoms are moderated.

‡ ℞.—Ol. terebinth. ℥iss.
Vitelli ovi.
Solut. gum. Arab. ℥viii.—M.

When the hysteric paroxysm precedes the eruption of the menses, camphor, or camphor with opium, is, according to the experience of Dr. Dewees, the most efficient remedy. He recommends the following mixture for this purpose*—a mixture which I have myself employed with much advantage in such cases. Here also warm pediluvia, rubefacient frictions to the inner part of the thighs, warm bricks wrapped in dry flannel and applied to the pelvis, turpentine enemata, and cold applications to the head, are particularly indicated.

In that variety of paroxysmal hysteria in which the patient lies in a state of torpor and insensibility distinct from syncope, I know of no remedy so effectual for dispelling the attack as an emetic. If a full dose of ipecacuanha, or of the sulphate of zinc, can be introduced into the stomach and vomiting excited, complete recovery will generally speedily ensue. I have known patients, after having lain for several hours in a state of insensibility, awaken as from a sleep, sit up and converse rationally almost immediately after vomiting was excited by an emetic. In cases of this kind, prompt relief may also sometimes be obtained from a large sinapism to the epigastrium. In a case which I lately attended, where vomiting could not be excited, although several full doses of ipecacuanha and sulphate of zinc were introduced into the stomach, I directed a strong sinapism to be applied over the whole epigastrium. In less than twenty minutes she suddenly raised herself, looked about with an air of surprise, and immediately began to vomit, which had the effect of soon removing every symptom of the complaint. Antispasmodic enemata, too, may be very beneficially employed in such cases—and for this purpose nothing, perhaps, is so effectual as an aqueous solution of assafœtida. Opium and the more diffusive stimulants do not appear to answer well in instances of this kind. Much benefit may, however, be occasionally obtained by stimulating the olfactory nerves with ammonia, or the fumes of a burned feather.

Besides the remedies already mentioned, a variety of other means may be employed with occasional success in the hysteric paroyxsm. The injection of very cold water into the rectum will sometimes promptly allay the hysteric paroxysm. Riverius speaks particularly in favor of the injection of cold water and vinegar; and Darwin used ice-water with marked success. Great benefit may also, at times, be obtained from injections of a decoction of ipecacuanha, in the proportion of two drachms of the root to eight ounces of water.

Dr. Dewees considers the so common practice of exciting the olfactory nerves by stimulating volatiles, as of very doubtful propriety. In plethoric habits, and where there is much sanguineous determination to the brain, the impropriety of this practice appears, indeed, very obvious. Richter observes, that applications of this kind are equally apt to prove injurious in cases attended with great general nervous excitability. There exists, moreover, in many individuals subject to hysteric affections, very extraordinary idiosyncrasies in relation to particular odors. Some patients will be very disagreeably or injuriously affected by certain articles of this kind, yet greatly tranquilized or beneficially excited by others.

Richter mentions the case of a lady who was always readily roused from hysteric stupor or syncope, by the smell of old and rank cheese. I know an hysteric female in this city, who is invariably very disagreeably affected by the smell of hartshorn, but the fumes of burning feathers rarely fail to produce beneficial effects. In some instances, the smell of strong vinegar does more good than the more volatile and pungent articles usually employed for this purpose. (Richter.) The smell of garlic bruised and moistened with vinegar, occasionally produces a very prompt and beneficial effect. We may sometimes suddenly arrest the lighter

* ℞.—G. camph. ʒii.
Spir. vin. rect. q. s. f. pulv. adde,
Pulv. g. Arab. ʒiii.
Tinct. thebaic. acetat. gtt. lx.
Sacch. albi ʒiii.
Aq. fontanæ ℥vi.—M. Dose—a tablespoonful every hour or two.

hysteric paroxysms by exciting some sudden emotion, as of anger, in the mind of the patient.

What I have hitherto said refers chiefly to *convulsive* paroxysms of hysteria. The most unmanageable and troublesome cases of this disease, however, are those chronic instances of hysteria usually denominated *nervous affections*, and which, though seldom marked by violent paroxysms, are nevertheless attended with frequent, and generally distressing nervous symptoms. As palliatives, the antispasmodics and narcotics already mentioned are very much employed in this modification of the disease. In general, *assafœtida* gives more perfect and prompt relief than any other article of this kind. Some patients, however, derive much more benefit from other antispasmodics. Indeed, there exists the utmost diversity with regard to the degree of relief obtained by different individuals from remedies of this kind. A mixture of sulphuric ether and laudanum* constitutes, with most patients, an excellent antispasmodic. Opium is, in truth, a most soothing remedy in chronic nervous affections. It allays the inordinate excitability of the nervous system; subdues for a time all unpleasant sensations and morbid sympathies; and diffuses a delightful feeling of tranquillity throughout the whole organization. Could these effects be enjoyed without the risk of contracting a habit for taking this oblivious drug, opium would, indeed, be to patients of this kind the *magnum donum dei*. Let no nervous person, however, resort frequently to this medicine. It will come at first like an angel, with its balmy powers, to dispel pain, lowness of spirits, and mental disquietude of every kind; it will bring hilarity and pleasantness of feeling when its aid is first invoked; but it will not fail ultimately to insinuate itself into every fibre, and to cause indescribable wretchedness and suffering to the unfortunate victim. In many individuals, the ordinary preparations of opium, particularly *laudanum*, produce very disagreeable effects. Where such an idiosyncrasy exists, and the indications are favorable to the employment of this narcotic, the acetated tincture of opium may, in general, be used without any unpleasant consequences whatever. Some patients, who cannot take laudanum without very distressing effects, will feel no inconvenience from it if it be given with eight or ten grains of the carbonate of potash.

Castor, with some individuals, is peculiarly beneficial as a palliative. I have frequently known this article to procure much relief after the more active antispasmodics have been ineffectually used. It seems to be particularly calculated to do good when the disease is attended with much uneasiness and flatulent pains in the lower part of the abdomen. Some persons, on the contrary, cannot take this medicine without unpleasant consequences. I have usually employed the castor in combination with other articles of similar powers, according to the following formula.†

In cases attended with much debility of the digestive organs, *valerian* often produces very excellent effects. From its gently tonic powers, it is, indeed, peculiarly suited to such cases. The ethereal tincture is an excellent preparation for this purpose.‡ An aqueous infusion, also, with the addition of 10 or 15 drops of the liquor ammon. succinata to each dose, or of four or five grains of supercarbonate of soda, generally answers very well.

The root of the *pathos fœtida* (*skunk cabbage*) will occasionally afford much relief in chronic hysteric affections. I have very often prescribed this article

* ℞.—Sulph. æther ℥ss.
Tinct. opii ʒii.—M. Take thirty drops every two hours till relieved.

† ℞.—Tinct. castor ℥ss.
—— aloes compos. ʒii.
—— opii ʒi.—M. S. Take from thirty to forty drops every hour until relieved.

℞.—Tinct. castor ℥ss.
—— valerian ether ℥i.
Liq. ammon. succinat. ʒii.—M. S. Twenty drops every hour or two.

‡ ℞.—Rad. valerian ℥i.
Æther sulphur. ℥viii.—M. Digest for three days. Dose, from thirty to forty drops.

with more than mere temporary advantage. A wineglassful of the infusion (one ounce of the root to a pint of water) may be taken every four or five hours.

In some instances of chronic hysteria, emetics have been known to act very beneficially. Dr. Dean, of Harrisburg, observes, "in come cases where the patients had labored under this disease for ten years, and during that time had, by the advice and direction of respectable physicians, exhausted, with at most but temporary benefit, the whole class of remedies which are usually prescribed, I have, by the continued exhibition of vomits, either entirely removed the complaint, or so far interrupted the habits of the diseased action in the stomach, that antispasmodics and tonic medicines would, in general, complete the cure."* I have, in a few instances, resorted to this practice with considerable advantage. Ipecacuanha is the proper article for vomiting in this affection.

In the management of chronic hysteria, it is particularly important to confine the patient to a light, unirritating, and digestible diet. No permanent relief can be procured where this rule is not rigidly adhered to. It is equally important to enjoin regular, but not fatiguing exercise, by walking or gestation in the open air; and all unpleasant mental excitement, or disagreeable sensorial impressions, should be as much avoided as possible.

Particular and continued attention must, moreover, be paid to the state of the bowels. If they are torpid, it will be necessary to order some mild aperient, so as to procure regular alvine evacuations. For this purpose, I know of no medicine so beneficial, in cases of this kind, as the following pills.†

In the remedial management of this form of hysteria, it is especially necessary to attend to the exciting causes of the disease. Neither proper regimen, nor the use of anodynes, antipasmodics, or tonics, will procure more than very incomplete and temporary advantage, so long as a fixed local irritation exists somewhere in the system. The primary object, therefore, should be, to ascertain, if possible, whether there is any source of irritation present. If no obvious exciting cause of this kind can be detected, which is, indeed, but very rarely the case, and the disease appears to depend mainly on a morbid irritable condition of the nervous system in connection with general debility, advantage may be expected from the use of tonics, in conjunction with a mild, digestible, and nourishing diet; regular exercise in the open air, and agreeable society. The ferruginous preparations will, in general, answer better in cases of this kind than the usual vegetable tonics. Iron is a peculiarly valuable tonic in instances where, along with an irritable and vascular system, the general habit is relaxed, enfeebled, and sluggish, and the digestive powers habitually feeble. The preparation I have found most beneficial in such cases is the prussiate of iron.‡ When given in full and regular doses, it scarcely ever fails to moderate the frequency of the pulse, whilst its fullness is increased. This article, in fact, possesses the power of at once diminishing the morbid irritability of the system, and of invigorating its powers. I have been much in the habit of employing it in diseases attended with great irritability and weakness, and frequently with the most decided advantage. It would seem that the prussic acid which it contains is sufficiently separated from its base by the vital actions, to exert its peculiar influence on the system. The cold infusion of wild cherry bark also is an excellent tonic in chronic hysteric complaints. In cases of this kind, much benefit may be obtained from the use of the shower-bath, in conjunction with the measures just

* Medical Recorder, vol. iv. p. 259.

† ℞.—Massæ pill. hydrarg. ℈ii.
G. aloes grs. xx.
Tart. antimon. grs. ii.
Pulv. capsici ℈ii.
Mucilag. g. Arab. q. s.—M. Divide into 40 pills. Take two every other night.

‡ ℞.—Prussiat. ferri ℥i.
G. aloes socc. grs. xv.
Conserv. rosar. q. s.—M. Divide into 30 pills. Take one every four hours.

indicated. The water should at first be tepid and impregnated with salt, and the temperature afterwards gradually reduced, in proportion as the energies of the system are invigorated.

Where, however, there is a fixed local irritation present, tonics are in general not only useless, but frequently injurious. Should the irritation exist in the alimentary canal, from a torpid and loaded state of the bowels, a course of mild purgatives must be instituted before recourse can, with propriety, be had to tonics. In instances connected with menstrual irregularities, efforts should be made to obviate this source of general irritation. The most common uterine disorder accompanying and supporting chronic hysteria, is profuse leucorrhœa and prolapsus uteri. I have within the present year succeeded in relieving two patients, who had for many years been almost continually afflicted with distressing nervous symptoms and debility, by the use of astringent injections into the vagina, the introduction of pessaries, and the internal use of tonics. Both these patients labored under profuse leucorrhœa, apparently entirely in consequence of very great prolapsus uteri.

Chronic hysteria is also frequently connected with habitual menorrhagic discharges. This is particularly apt to be the case about the period of the final cessation of the menses. In instances of this kind much advantage may sometimes be derived from minute doses of aloes, in conjunction with the use of from thirty to forty drops of the tincture of cinnamon three or four times daily.

In some instances chronic hysteria depends on phlogosis of the mucous membrane of the alimentary canal. I attended a lady last summer who had been almost continually affected with various hysteric symptoms for several years. She had used much medicine, but with little or no advantage. I found her epigastrium somewhat tense, and very tender to the touch. Leeches were directed over this region, and afterwards frictions with tartar emetic ointment—and the lightest farinaceous diet enjoined. By the use of these applications, without any other remedial means, her health was completely restored.

Occasionally habitual nervous symptoms are excited and maintained by intestinal irritation from an accumulation of feculent and other irritating substances. When the bowels are torpid, the abdomen tumid and hard, the alvine discharges small and unnatural, the breath fetid, the appetite variable, and the patient complains of an itching in the nose, a course of laxatives—or what is, perhaps, better, the daily use of purgative enemata, with a mild diet, an occasional small dose of blue pill, and small portions of infusion of any of the tonic vegetable bitters, constitutes an appropriate course of treatment.

When the disease is attended with a morbid exaltation of the sexual propensities—a circumstance which we sometimes detect by the actions and conversation of the patient—or of which we are informed by the candid and very proper avowal of the sufferer—*camphor*, in union with hyoscyamus—regular exercise, sleeping on a hard matress, early rising, the cold or tepid shower-bath, and traveling, will rarely fail to afford particular benefit.

The cold bath is always a powerful auxiliary in the treatment of hysteric affections. Where the debility is great, tepid water ought at first to be used for bathing, and the temperature gradually diminished, if we find the system sufficiently energetic to react after coming from the bath. In general, much more advantage will be derived from the *shower-bath* than from other modes of applying the water; and we may enhance the beneficial effects of the bath by adding a considerable portion of salt to it. Sea-bathing, with exercise by walking, or gestation, rarely fails to improve the health of nervous patients. Chalybeate mineral waters, in conjunction with agreeable society, and free motion in the open air, is also a most excellent remedial means in cases of this kind.

Sect. VIII.—*Puerperal Convulsions.*

Eclampsia Gravidarum et Parturientium.

The term *puerperal*, given to this form of convulsive disease, is not a very appropriate one; for the puerperal state is by no means necessarily connected either as a concomitant occurrence, or as the cause of this frightful affection. The condition of pregnancy seems, however, in some way or other, very essentially concerned in its causation. Dr. Dewees thinks that this disease may occur in pregnant women from causes unconnected with gestation. This may be true; but the state of pregnancy would, nevertheless, seem to have an especial agency in modifying or aggravating convulsions, from whatever immediate exciting cause they may arise. What, we may ask, gives to this variety of convulsive disease its peculiarly dangerous and fatal character? It can only be attributed to certain circumstances connected with advanced pregnancy, or with the process of parturition. It is, indeed, highly probable, that the disease under consideration is essentially an epileptic affection, aggravated and supported by the influence of the gravid uterus. Epilepsy is, manifestly, always attended with strong vascular turgescence in the brain, and the same condition is as obviously present in puerperal convulsions. Epilepsy is not, however, a very dangerous affection; whereas *eclampsia gravidarum* is always peculiarly hazardous. Whence, then, this striking difference of severity between these two affections? May it not depend chiefly on the tendency of the distended uterus, in the latter period of gestation, to favor the determination of blood to the head, and to keep up the vascular turgescence in the brain? If by the peculiar position, or great distension of the uterus, the large arteries in the lower part of the abdomen are in some degree compressed, the blood will, one may presume, be more abundantly determined to the vessels of the head; and if the vascular turgescence in the brain be very strong, a paroxysm of convulsions may be the result. If, then, a fit of convulsions is thus excited or brought on by causes not immediately connected with pregnancy, the paroxysm will be aggravated, and supported by the continued effects of the enlarged uterus in determining the blood to the head.

In epilepsy attacking females in the early months of pregnancy, or in the unimpregnated state, there is but little immediate danger to be apprehended; for the vascular turgescence in the brain is not supported by a permanent cause of sanguineous determination to the head. When the disease, however, is excited by pressure of the uterus upon the large arteries in the lower portion of the abdomen, or at the entrance of the pelvis, the cause which in the first place produces the cerebral congestion, and consequently the convulsions, continues and maintains, or still further increases the vascular turgescence within the head, and can hardly fail to give rise to fatal effusion, if the general mass of the blood be not promptly and greatly diminished by venesection, or the fœtus be not speedily expelled from the uterus to enable this organ to contract. The premonitory symptoms, the character of the remedies calculated to do good, and the phenomena of the disease itself, all indicate in the most unequivocal manner, that it is preceded and accompanied by strong sanguineous congestion in the head; and the exclusive confinement of the disease in its characteristic form to the latter period of gestation, when the uterus has attained its greatest volume, as well as the occasional complete subsidence of the convulsions when delivery is speedily effected, afford very plausible evidence that the cerebral congestion upon which the paroxysm probably immediately depends, is either the direct consequence of, or strongly promoted by an impediment offered to the arterial circulation in the abdomen from pressure by the distended uterus.

The attack of puerperal convulsions is invariably preceded by premonitory

symptoms indicative of strong determination to the brain. In some instances, they are experienced for many days previous to the occurrence of the paroxysm; in others, they occur only a few hours before the supervention of the attack. They consist in a sense of fullness, weight, tension, severe and deep-seated pain in the head, vertigo, ringing in the ears, temporary blindness, weakness of the inferior extremities, a fullness of the vessels of the head, and occasionally a severe dull pain in the stomach.

After these symptoms have continued for a longer or shorter period, the patient is suddenly seized with convulsions. The muscles of the face are in a state of rapid convulsive action, and the whole body is frightfully agitated, as in severe cases of epilepsy. In some instances, the convulsive actions are stronger on one side than the other. During the paroxysm, the face is flushed, livid, and turgid with blood; the tongue is thrust out between the teeth; the carotids beat violently, and the jugulars and veins of the head are greatly distended; the respiration is at first hurried, with a sputtering noise of the lips, and towards the conclusion of the fit, a copious discharge of frothy saliva issues from the mouth. The pulse is at first full, strong, and tense, becoming afterwards smaller, rapid, and eventually almost imperceptible. (Dewees.)

The subsidence of the paroxysm is always gradual; "the force and frequency of the convulsions abate, the pulse becomes more distinct and less frequent, the breathing is less hurried and less oppressive; the face loses part of its lividity; the muscles are agitated only at intervals, and their action resembles the commotion excited by passing a brisk electric shock through them, and eventually sink into repose. The patient, however, remains for the most part insensible or comatose, with stertorous breathing or loud snoring; she cannot be roused by any exertion for some time, and if she recover, for a moment, her scattered senses, she is without the slightest recollection of what passed. This truce is almost always of short duration; convulsion follows convulsion, without our being able to determine the period or the cause of their return."

Dr. Dewees has divided this affection into three varieties—namely, the epileptic, the apoplectic and the hysteric. It does not appear clear, however, upon what grounds he has founded the second variety; for he points out no material circumstances by which it is distinguished from the epileptic variety. What he calls the apoplectic variety of the disease, is evidently only a higher grade of the epileptic variety, and differs from it merely in the greater degree of vascular turgescence in the brain, and the increased liability to fatal extravasation or effusion. Puerperal convulsions, as I have already observed, appear to be essentially epileptic—that is, immediately dependent on strong sanguineous congestion in the encephalon, from whatever cause this may arise. When the determination to the head is very great, the symptoms will assume more or less of an apoplectic character, or fatal extravasation may be the consequence.

The division of the disease into the *epileptic* and *hysteric* varieties, however, is founded on correct pathological principles, and is especially important in a practical point of view. It would, indeed, be more proper, perhaps, to consider them as distinct forms of convulsions—the one essentially hysteric, the other epileptic. Although hysteria is by no means a common affection after the term of quickening in pregnancy, hysteric convulsions may, nevertheless, occur from the ordinary exciting causes of this affection during utero-gestation, in individuals of a nervous temperament or an hysterical habit. The hysteric variety of this disease is often excited by mental emotions, and may be distinguished from the epileptic form by the premonitory symptoms, which are generally distinctly hysterical—such as violent palpitation of the heart, a feeling of faintness, globus hystericus, a pale instead of a suffused countenance, &c.; and by the phenomena of the paroxysm, which, though indicative of violent nervous irritation, do not manifest any very violent degree of vascular turgescence in the head. The face is not much flushed, and in some instances remains even of a pallid hue. The larger muscles are agitated with extreme violence; and those on the posterior

part of the body are generally thrown into a state of violent tonic contraction, causing a rigid recurvation of the body—the head and lower extremities being drawn backwards, whilst the breast, abdomen, and hips, are thrown forwards into an arch, as in tetanus. "There is no frothing at the mouth; and the patient, after the fit, can, for the most part, be roused by attention, or will frequently become coherent as soon as she recovers from the fatigue or exhaustion occasioned by the violence of her struggles, and though she may lie apparently stupid, she will, nevertheless, sometimes talk or indistinctly mutter. After the convulsion has passed over, she will often open her eyes and vacantly look about; and then, as if suddenly seized by a sense of shame, will sink lower in the bed, and attempt to hide her head under the clothes."*

Treatment.—From what has already been said concerning the pathology of this affection, it is manifest that in the epileptic form of the disease, the principal indication is to lessen as speedily as possible the sanguineous engorgement of the vessels of the brain. The treatment, in short, differs in no essential point from that which is proper in apoplexy. Blood should be promptly and copiously abstracted. This measure may be regarded as absolutely indispensable to success in the management of this affection. In a case which I lately saw in consultation with Dr. Dunn, nearly forty ounces of blood were at once abstracted. This evacuation, together with sinapisms to the feet and purgative enemata, succeeded in removing the disease, and the patient was, in about a week afterwards, delivered of a healthy child without any further unfavorable occurrences. In conjunction with copious abstractions of blood with a lancet, local bleeding by cupping from the temples or shaven scalp, may be of material service. Much benefit may also be derived from cold applications to the head, while sinapisms are applied to the inferior extremities. The rectum should be evacuated by laxative enemata; and as soon as the patient is able to swallow, an active cathartic ought to be administered.† These constitute almost the only useful or proper remedial means in the treatment of this form of convulsive disease. When the disease occurs near the termination of the period of gestation, labor is almost always brought on; and it should be a rule to deliver as speedily as can be done with propriety; for the expulsion of the fœtus often puts a termination to the recurrence of the paroxysms. Such a favorable result is, however, not always obtained from the evacuation of the uterus. When the onset of the disease has been violent, and the cerebral congestion is strong and continuous, the paroxysms will recur again and again after the delivery of the child is effected; and such instances rarely terminate otherwise than in death. If the os uteri is somewhat dilated and dilatable without much effort, it is best, nevertheless, to deliver at once by turning and bringing down the feet. I have in two instances, delivered in this way with the happiest effect on the disease. In another case, however, a patient of Dr. McClellan, the result was not favorable. The delivery was easily accomplished, and the patient appeared to do well when I left her. She was induced, however, by her friends, to take a little whisky, "to strengthen her heart," (she was an Irish woman;) and the consequence was a return of the paroxysms, which soon terminated her life. When the os uteri is rigid, no advantage can be obtained by forcibly dilating it and delivering by the feet. In such cases, it is better to wait until the head is forced down in the cavity of the pelvis, and to deliver with the forceps as soon as it can be accomplished.

In the hysteric variety of the disease, bleeding, though not so absolutely indispensable as in the former variety, can, nevertheless, not be prudently dispensed with. In general, from sixteen to twenty ounces of blood taken from the arm will suffice in cases of this kind. Where, however, the momentum of the circulation is strong, and the symptoms indicate much engorgement of the vessels of

* Dewees.

† ℞.—Calomel grs. x.
P. jalap grs. x.
—aloes grs. v.—M. To be taken all at once.

the head, the bleeding must be continued without any regard to quantity until the action of the pulse is decidedly moderated. The rectum should also be immediately emptied by purgative enemata, and sinapisms may be applied to the wrists and feet. If, from the constitutional habit of the patient, the nature of the exciting cause, and the premonitory and actual symptoms of the case, there is no reason to doubt of its hysterical character, recourse should be had, after the foregoing means have been used, to opiates and antispasmodics. A full dose of laudanum with an assafœtida enema, will, in general, answer better for this purpose than any other remedies of this kind. The case, in short, should be treated as a paroxysm of hysteric convulsions.* Instances of this kind very rarely terminate fatally. Dr. Dewees has never known an instance of death from this variety of the disease. It is equally rare that parturient pains are excited by this affection. When it occurs in the early periods of pregnancy, however, it may give rise to abortion—an instance of which occurred to me a few years ago.

Sect. IX.—*Tetanus.*

Tetanus consists in violent *tonic* spasms of the voluntary muscles, with the powers of sensation and thought unimpaired. There exists, therefore, a radical difference between this disease and the affections which are properly called *convulsive;* for in the latter forms of spasmodic disease, more or less disorder of the sensorial and intellectual powers almost always exists, and the spasmodic affection is characterized by sudden contractions and relaxations of the voluntary muscles, alternating in quick succession, giving rise to violent concussive motions of the body and extremities.

Tetanus is divided by nosologists into different varieties, according to the particular set of muscles chiefly affected. When the affection is confined to the muscles of the jaws and throat it is called *trismus*, or locked-jaw. Sometimes the extensor muscles of the trunk and inferior extremities are principally implicated, causing a rigid recurvation of the body, so as to bend it violently backward into the form of an arch—and this variety is denominated *opisthotonos*. The term *emprothotonos* is applied to the disease when the body is curved forwards; and *pleurothotonos* designates its lateral incurvation. These distinctions possess no practical importance—the disease being essentially the same in all of them. There is another distinction, however, founded upon etiological circumstances, which it is of more consequence, both in a prognostic and therapeutic point of view, to bear in mind:—namely, the division of the disease into *idiopathic* and *traumatic* tetanus. The former term is applied to those cases which arise from the operation of general causes; such as cold, or narcotic poisons; the latter designates those instances which occur in consequence of some mechanical injury; such as wounds, bruises, burns, and other organic lesions.

Tetanus almost always approaches gradually—so that several days often elapse between the first manifestations of its invasion, and its state of complete development. At first, slight spasmodic sensations are usually felt in the muscles of the larynx; in consequence of which the voice undergoes some change, and deglutition sometimes becomes slightly affected. About the same time an uneasy sensation is occasionally felt in the præcordial region, and soon afterwards a feeling of stiffness occurs in the muscles of the neck, and about the shoulders. The muscles of the jaws now begin to stiffen. At first this rigidity is not so great as to prevent the patient from opening his mouth to a considerable extent. The contraction, however, increases with more or less rapidity, until the teeth

* [It is in such cases as these that the Indian hemp, lately introduced to the notice of the profession by Dr. Shaughnessy, is most serviceable. The late Dr. Klapp afforded immediate and permanent relief in one instance by the administration of a grain dose, after the unsuccessful use of other antispasmodics and stimuli.—Mc.]

of the upper and lower jaws are immovably pressed against each other. When the disease has advanced to this stage, sudden and painful retractions about the scrobiculus cordis occur at intervals, accompanied by a simultaneous retraction of the head and an aggravation of the symptoms already mentioned. Deglutition, even during the intermissions of these paroxysms, is now performed with pain and difficulty, and is apt to excite a return of the spasms. As the disease advances, the pain and retraction at the epigastrium return every ten or fifteen minutes, in exceedingly violent paroxysms, and are always immediately followed by a powerful spasmodic retraction of the head, and a rigid contraction of almost every muscle of the body. The muscles of the chest and throat are violently and painfully contracted; the arms and legs forcibly extended; the shoulders thrust forwards; the abdominal muscles firmly retracted against the viscera; and the whole frame thrown into a most painful and unyielding state of tonic spasm. These paroxysms last usually but a few minutes—the muscles of the trunk and extremities resuming for a while a comparatively relaxed state; but those of the jaws remain firmly contracted during the remissions. In the latter period of the disease, the spasms remit but slightly and transiently: the patient is in almost a continued rack of torture; the muscular contractions are general and extremely violent; the countenance becomes frightfully distorted; copious sweats break out; the pulse is quick and irregular; the respiration hurried and laborious; the voice grating and unnatural; the eyes dim and watery, and the jaws immovably locked. Towards the fatal termination of the disease slight delirium generally occurs. At this period a severe spasm often terminates the scene.

The usual mode of termination in fatal cases is by apoplexy. In some instances, all the muscles become completely relaxed a short time before death takes place. The patient seems to have emerged from this terrible malady. Every part of the body is in the ordinary state of relaxation. Suddenly, however, extreme prostration of strength ensues. He becomes insensible and comatose; the countenance assumes a cadaverous expression, and death speedily follows.*

It is worthy of notice, that the muscles which are supplied with ganglionic nerves, as well as those which derive their nerves immediately from the brain, do not become affected until towards the fatal termination of the disease. The muscles of the fingers and the tongue are seldom affected until the disease has acquired its utmost degree of violence.

The mind is very rarely disordered in tetanus. I have seen instances in which the intellectual powers remained entire up to the last moment of the disease. The appetite and the digestive functions, also, are generally but little affected. During the paroxysms the pulse is contracted, hurried, and irregular, and respiration is affected in like manner. In the remissions, both the pulse and respiration usually do not differ much from their natural conditions.

The duration of tetanus is various, although it commonly terminates before the fifth or sixth day, and not unfrequently as early as the third day. In some instances, however, it continues much longer, and occasionally it assumes a chronic character. (Richter.) When the disease is about terminating favorably, the remissions become more complete and protracted, during which, patients frequently experience a sense of *formication* in the extremites. It always passes off very gradually, and in general the pectoral and abdominal muscles are the last to regain their healthy condition. An increased irritability of the nervous system and general weakness continue several months after recovering from an attack of tetanus. According to the statements of some writers, tetanus sometimes passes into other forms of disease. Stark states that it has been known to terminate in remitting and intermitting fevers.† Instances have also been recorded, in which paralytic affections remained after the subsidence of the disease. (Richter.)

* Richter, Specielle Thérapie, bd. viii. p. 368.

† De tetano ejusque specibus præcipuis, causis et ratio curandi, p. 169.

Causes.—Tetanus is most apt to occur in young and robust individuals of irritable habits of body. It is rarely met with in persons of very advanced age; new-born infants, however, are peculiarly liable to its attacks. High atmospheric temperature appears to exert a powerful influence in predisposing the system to tetanus. It increases the general irritability, and by exciting inordinately the perspiratory function, renders the system more susceptible of the injurious influence of sudden applications of cold. It is on this account, that idiopathic tetanus is so much more common in hot than in temperate and cold latitudes. In intertropical countries, it occurs most frequently along the sea-coast and in elevated situations. The cool sea-breeze during the night, after the heat of the day, seems in such localities to be the ordinary exciting cause of idiopathic tetanus. Schmucker states that tetanus occurred very frequently in the Prussian army from slight wounds in the mountainous districts of Bohemia, where in summer the days are extremely warm and the nights uncomfortably cool.

The *exciting* causes, as has been already intimated, are of two kinds, namely: such as produce local or structural lesion; and such as affect the system by a general influence. Of the former kinds are wounds or mechanical injuries; and of these, contused, lacerated, and punctured wounds, are most apt to give rise to this affection. Tetanus is particularly apt to follow wounds in which a nerve is partly divided, or lacerated without being completely divided. The insertion of an artificial tooth, (Plenk;) including a nerve in a ligature passed round an artery; amputation; the extirpation of tumors; compound and comminuted fractures; gun-shot wounds; cutting corns on the feet too closely;* the sudden access or introduction of cold air into wounds, particularly of gun-shot wounds, when the sloughs are about being thrown off, (Larrey;) in short, every kind of incised, punctured, lacerated, or contused wounds, however trivial, may, under favorable circumstances, give rise to this affection. I once met with a very remarkable instance which appeared to have been excited by the irritation of a dead fœtus in utero.† Tulpius mentions a case of tenanus from suppurative ulceration of the bladder in consequence of calculous irritation.‡ Richter has known it occasioned by the removal of an encysted tumor from the cheek; and De Haen mentions an instance which was excited by the application of lunar caustic to a similar tumor.§ A case is mentioned by Bajon,‖ which was caused by the application of an escharotic to an ulcer on the leg. Instances of tetanus produced by gangrenous wounds are mentioned by Mursinna,¶ Hopfengaertner, and White. The most dangerous wounds, however, in this respect, are punctures of tendinous, aponeurotic, and very nervous parts—as the palms of the hands, soles of the feet, and under the nails of the fingers and toes. Traumatic tetanus frequently does not come on

* I have seen a fatal case produced in this way.

† This case occurred about eight years ago. A poor woman in the ninth month of pregnancy, who resided at Bush Hill, came to my office for medical advice. She walked into town, and appeared to be healthy. She complained, however, of an inability to open her jaws, and I found that she could not separate the teeth more than about an eighth of an inch. She could assign no cause for this affection. I ordered her to be bled, and to apply a blister on the back of the neck. Next day I was requested to visit her. I found her much more indisposed than on the previous day, and the jaws were now firmly locked, with slight spasmodic contractions of the muscles of the throat. I bled her profusely, gave her another cathartic, and applied caustic potash over the track of the temporal muscles, and along the course of the cervical vertebræ. On the following morning, I found her affected with distinct and general tetanic paroxysms, which gradually became more and more violent and frequent. In the afternoon, I discovered, during the intermissions of the spasms, that labor had commenced. On examination, I found the os uteri considerably dilated, and the head of the fœtus in the cavity of the pelvis. I immediately sent off for a forceps, and in the course of about half an hour after, delivered her of a dead and partially putrid fœtus. The tetanus, nevertheless, continued, and terminated in death on the following morning. I observed that the parturient contractions of the womb, and the tetanic spasms, recurred in regular alternation.

‡ Observ. Med., Amst., 1672, lib. iii. cap. ii.

‖ Journ. de Méd., t. xxx. p. 419.

§ Ratio Medend., Pars. vi. cap. iv. § ix.

¶ Journ. f. Chirurgie, 1820, b. i. st. iii.

until the wound which gives rise to it has cicatrized. Most commonly the disease supervenes about the eighth or ninth day, and this is especially the case when it arises from gun-shot wounds. Sir J. M'Grigor asserts that if tetanus does not occur within twenty-two days after the injury has been received, the patient may be regarded as free from danger on this account.*

Among the general causes of this affection, cold, suddenly succeeding high atmospheric temperature, is decidedly the most powerful. Sleeping in the open and cool night air is a very common exciting cause of tetanus in hot climates. The influence of cold appears to be particularly favorable to the occurrence of this disease from wounds or mechanical injuries. I have already referred to the observations of Schmucker and Larrey on this point, and Mursinna has noticed this circumstance particularly. When the disease occurs from this cause, it generally comes on about the third or fourth day of the exposure. The very frequent or endemic occurrence of tetanus in southern climates—at Barbadoes, Java, St. Domingo, Cayenne, and generally in the Antilles, as described by Hillary, Pouppée, Desportes, Bajon, Moseley, Blane, Clark, and others, must be ascribed to the combined, or rather alternate influence of high atmospheric temperature, and of cold and damp night air. Tetanus may also be produced by drinking cold water while the body is in a state of free perspiration from fatiguing exercise in warm weather. Rush, Mursinna† and Stuitz‡ mention instances occasioned in this way. Tetanic spasms sometimes occur in the latter stage of severe forms of fever.

Pathology.—From seeing those muscles particularly affected which derive their nerves from the spinal marrow—whilst those which are supplied with ganglionic nerves are, in a great measure, exempt from spasm; as well as from the undisturbed state of the sensorial and intellectual functions—tetanus was, at an early period of our science, referred to the *spinal* marrow as its primary and essential location.§

This view of the pathology of tetanus is founded chiefly on the phenomena usually detected in the spine on post-mortem examination; and on the artificial production of tetanic symptoms by certain mechanical injuries of the spinal marrow. Dr. John Frank was the first who directed the attention of physicians particularly to the morbid appearances of the spinal marrow in those who die of tetanus. In one instance he found the spinal marrow soft and considerably altered in structure, with effusion of serum between its coats, and an engorged state of the blood-vessels. In another case, strong tracess of previous inflammation were detected throughout the whole extent *of one side* of the spinal prolongation.‖ Dr. Reid afterwards published a paper, (*loc. cit.*,) from which it would appear that the principal seat of the inflammation is in the membranes of the spinal cord. In an extremely violent case, he found a whitish soft substance deposited between the arachnoid membrane and the pia mater. In less violent cases, serous effusions were found between the membranes. Similar observations have been published by d'Outrepont, Walther, Saunders, Abercrombie, Broussais, Monot, Jobert,¶ and other pathologists. This pathology of tetanus is, moreover,

* Medico-Chirurg. Transact., vol. iv. p. 449. † Journ. f. Chirurgie, b. i. st. iii. p. 406.

‡ Medic. Annalen., 1802, p. 756.

§ Galen was of this opinion; and Willis, Fernelius, (*a*) Burserius, (*b*) Hoffman, and more recently Frank, Marcus, d'Outrepont, (*c*) Walther, Schaal, (*d*) Le Galois, Brera, Thompson, Abercrombie, Harles, Rachetti, Esquirol, Copeland, Carter, Philip, Brodie, O'Bierne, (*e*) Reid, (*f*) Saunders, and others, have expressed similar views.

‖ The side of the spinal matter, which was thus affected, corresponded with the hand injured that gave rise to the disease.

¶ Monot and Jobert's report of some cases that occurred in the Hospital St. Louis and St. Antoine. Medico-Chirurg. Rev., January 1827.

(*a*) De Medicina Universa.—Pathol. vi. ch. iii. p. 417.
(*b*) Institutiones Med. Pract., vol. iii. p. 201.
(*c*) Salzburg Medicinische Chirurgische Zeitung., No. xxxiv., 1818.
(*d*) Dissertat. de Tetano, Berol, 1820.
(*e*) Dublin Hospital Reports, vol. iii.
(*f*) Transact. of an Associat. &c. of the King and Queen's College of Physicians in Ireland, vol. viii.

supported by the fact, that tetanic spasms may be artificially produced in animals by thrusting a slender wire along the spinal canal, so as to irritate the marrow without materially compressing it. This experiment has been frequently performed by Dr. Walther, of Berlin, with the most striking results; and similar consequences were witnessed from this operation by Le Galois, Philip, Brodie, and other physiologists. The fact, therefore, that strong marks of inflammation in the spinal prolongation of the encephalon are very common post-mortem phenomena in tetanus, appears to be sufficiently established. It may, nevertheless, be doubted whether these morbid conditions of the spinal cord be the proximate and essential cause of the tetanic spasms, or only secondary, and one of the ultimate consequences of the disease. If, on the one hand, this view of the nature of the disease be favored by the occasional successful employment of topical bleeding, blistering, irritating and cauterizing applications along the course of the spine, it is, on the other hand, as strongly discountenanced by the equally frequent beneficial effects of alcoholic liquors, and other powerful internal stimulants. It is highly probable, notwithstanding that there exists, as an essential link in the chain of causation, strong irritation in the spinal marrow and its membranes, which, in most instances, give rise to vascular turgescence, and in the progress of the malady, to inflammation and consequent effusion or disorganization. Inflammation and its consequences are, I presume, not essential to the production of the disease, but a consequence only of the spinal irritation upon which the spasmodic affection depends.*

Mr. Swan, a few years ago, published an essay on this disease, in which several cases are related, tending to show that tetanus depends on irritation and inflammation of the ganglia.† In the cases which he reports, the ganglia of the great sympathetic manifested unequivocal marks of irritation and disease. The semilunar ganglion was, in most instances, strongly injected, and all the other ganglia of this nerve were more or less inflamed.

Prognosis.—The prognosis in this disease is always highly unfavorable.‡ Traumatic tetanus is particularly fatal in its tendency. Cases that depend on general causes are usually much more under the control of remedial management. That variety of tetanus which occurs in new-born infants (*trismus nascentium*), terminates almost universally in death. Parry asserts, that if the pulse becomes very frequent on the first day of the disease, if it rises above one hundred and twenty beats in a minute, the case may be regarded as inevitably mortal. When, on the contrary, it does not go beyond one hundred or one hundred and ten beats by the fourth or fifth day, reasonable hopes of recovery may be entertained. "When the disease comes on gradually, and the muscles of the jaws are alone affected during the first three or four days; when the abdomen is not preternaturally hard, and the bowels obstinately costive; when the skin is moist and moderately warm; and above all, when the patient enjoys sleep, we may entertain strong hopes of an eventual recovery. An increased flow of saliva, where mercury has not been

* Dr. M. Funk, a German physician, has lately published an account of several dissections of persons who had died of tetanus. In the first case, the dura mater was reddened in the cervical portion of the spinal cord; about the first dorsal vertebra, and below it, the canal was filled with extravasated blood, which had also extended a short distance along the nerves. In the lumbar region the extravasation was greatest, and the dura mater was here considerably thickened. The surface of the cord itself was rose-red, the origin of the nerves swelled, and the cauda equina much reddened. In another case a large quantity of bloody serum was found between the dura mater and arachnoid, and the vessels were very much injected, with some extravasation throughout the whole course of the spine. In a third, fourth, and fifth case, equally strong marks of spinal inflammation were detected. (*a*)

† An Essay on Tetanus, founded on Cases and Experiments. London, 1825.

‡ Aretæus very justly designates tetanus as, inhumana calamitas, injucundus aspectus, triste intuenti spectaculum, *et malum insanibile.*

(*a*) Glasgow Medical Journal.

used, is always to be regarded as favorable; and the less the general expression of the countenance is changed, the better. On the other hand, where the attack is violent and sudden; where the muscles of the neck, back and abdomen are rigidly contracted; when the patient complains of a shooting pain from the sternum towards the spine; when the belly feels hard, and the least pressure thereon produces spasmodic twitchings or contractions of the muscles of the neck, jaws, &c.; or when the same effect is brought about by the presentation of any substance, solid or fluid, near the mouth, we may have much reason to fear a fatal termination."*

Treatment.—When a wound or injury has been received, from which tetanus may be apprehended, efforts should be made to prevent its occurrence, by a proper management of the local injury. Experience has fully established the fact that the best means for preventing the disease is the production of free suppuration in the injured part. When this process can be fully established in wounds, even of the most unfavorable character, the occurrence of the disease will almost certainly be prevented. It has been frequently observed, that the less inflammation there is in the injured part, the greater will be the liability to tetanus. This circumstance has suggested the propriety of exciting inflammation in the wounded part, by means of irritating applications. For this purpose we may apply spirits of turpentine, *lunar caustic*, caustic ley, cantharides, or, according to Larrey, the actual cautery, followed by warm stimulating poultices; or the part may be incised or scarified, and afterwards further irritated by some application of this kind. When nerves or tendons are but partially divided by the injury, the division should be completed by free incision. General remedies have also been recommended with the view of preventing the disease. Larrey insists strongly on the importance of preventing the access of cold and damp air to wounds, particularly gun-shot wounds, as a prophylactic measure. Dr. Thomas states, that in the British army, opium is mixed with the dressings as a preventive of this affection. Dr. Potter, of Baltimore, states, that he has found no application so useful, in this respect, as warm emollient cataplasms.† Dr. Clark‡ advises a slight mercurial ptyalism after unfavorable wounds, more especially in hot climates. An equable and comfortable temperature, with a simple diet and rest, is an important auxiliary in preventing the disease after wounds.

A very great variety of remedies and modes of treatment have been proposed, and occasionally employed with success in this frightful malady. The practitioner who consults the records of medicine for light on the remedial management of tetanus, will probably find himself very much perplexed. He will find the doctrine of its dependence on spinal and ganglionic *inflammation* strongly countenanced by examples of post-mortem phenomena; and yet he will read, on the one hand, the laconic, but sweeping denunciation against the most powerful antiphlogistic—" bleeding is to be condemned;"§ whilst on the other hand, he will find stimulants and tonics reprobated, and prompt and copious depletion pointed out as the sheet-anchor of our hopes. He will find Broussais and others ridiculing the idea of treating tetanus with stimulants and antispasmodics;‖ and then, turning to Morrison and a great number of other respectable authorities, he will learn that these are the very remedies which, in their hands, proved most successful. These facts may be irreconcilable, according to our imperfect views of the pathology of this affection, but they are notwithstanding facts, and there is, therefore, something in the nature of the disease, which, in spite of theory, renders both exciting and depletory measures, at times, decidedly beneficial. To me, indeed, these apparently contradictory statements appear to admit of a plausible though hypothetical explanation. Tetanus is manifestly an irritative disease. In the traumatic variety, it would seem to be the result of a peculiar irritation, passing from the extremities of wounded nerves to their origin, giving rise to

* Dr. Morrison.—Vide Johnson on Tropical Climates, vol. ii.
† Note to Gregory's Practice, vol. ii. p. 141.
‡ On the Diseases of the West Indies.
§ Elements of the Theory and Practice of Physic, vol. ii.
‖ Journal de Med. Phys., Fev. 1827.

morbid action in that part of the nervous centre which more immediately presides over the powers of the voluntary muscles. Hence, opium and whatever is capable either of blunting the irritability, or causing a strong counter-excitement in the nervous system, may overcome morbid excitement and ultimately subdue the disease. As, however, all violent local irritation tends to produce congestion, and finally more or less inflammation in the part, this may at times be an early consequence. Here, general and local depletion will be proper; and, if promptly and efficiently practised, in conjunction with other suitable remedies, before effusion and disorganization have taken place, may prove successful. Nay, even direct depletion, and the liberal use of opium, are not incompatible, for, while we diminish the momentum of the circulation on the one hand, we lessen, on the other, the morbid irritation upon which the disease and inflammation depend.

No small number of cases may be cited in which copious blood-letting was decidedly beneficial. Mr. Barr bled a young man affected with traumatic tetanus, to the extent of fifty ounces at once, *pleno-rivo*. In half an hour the patient's jaws relaxed in some degree, and three fluidrachms of laudanum were exhibited. The spasms continued, though in less violent and frequent paroxysms. He was afterwards bled to the amount of thirty-two ounces on the third day, and sixteen on the fourth. Exceedingly large doses of calomel and opium were also regularly given. On the fifth day, the disease yielded completely.* M. Lisfranc has reported a successful case, in which eight bleedings were practiced from the arm, and in the course of nineteen days, six hundred and eighty leeches applied along the vertebral column.† M. Burmester treated a case of traumatic tetanus successfully by copious *blood-letting*, opium, mercury, and the warm bath.‡ We may also refer to the case reported by Dr. Alexander, which yielded to copious and repeated venesection, leeches to the abdomen, mercury, and active purging.§ M. Le Pelletier, chief surgeon of the hospital at Mans, in an able memoir on this disease, observes: "It is neurilemmatic inflammation that we must attack in the treatment of tetanus, and the only means sufficiently powerful to subdue it in its bud is *venesection*, not practised with reserve, but with the utmost degree of promptness and freedom.‖ Local bleeding by leeches or cups along the track of the spine, is decidedly indicated in this affection." When we reflect, says Dr. Johnson, that the brain and spinal marrow must be the immediate seat of the irritation or inflammation which gives rise to the phenomena of tetanus, we can hardly look with confidence to any remedy which has not a strong tendency to remove this irritation or inflammation. What is more likely to effect this indication than powerful and repeated depletion from the head and spine, but especially from the latter?¶

Purgatives, also, are important auxiliaries in the treament of this affection. Dr. Hamilton recommends their use as a *principal* curative means; but he does not adduce any very decisive or direct evidence from his own experience, in support of the propriety of relying chiefly on their employment. He gives, indeed, some statements from his own practice of the good effects of active purgation in what "appeared" to him cases of incipient tetanus, but it may be reasonably doubted whether these instances were really tetanic. Unquestionably, cathartics deserve to be regarded as highly useful remedies in this disease, but we may, with propriety, I think, demur, when we are advised to rely on them as principal curative means. In all instances, perhaps, it will be proper to exhibit active cathartics, not only with the view of removing the ordinary sources of intestinal irritation, but also as revulsive and depletory measures. From fifteen to twenty grains of calomel, followed in the course of four or five hours with a dose

* Edinburgh Med. and Surg. Journ., No. xvii.
† Rev. Médicale, tom. ii. for 1829, p. 342.
‡ Med.-Chirurg. Transact., vol. xi. art. xiv.
§ Edinb. Med. and Surg. Journ., Oct. 1825.
‖ Revue Médicale, tom. iv. ann. 1827, p. 346.
¶ Medico-Chirurg. Rev., July 1827, p. 176.

of castor oil and spirits of turpentine, (an ounce of the former to two drachms of the latter,) may be given in the commencement of the disease, and repeated according to the circumstances of the case. In that variety of the disease which occurs in new-born infants, purgatives have been generally considered as indispensable.

There is no remedy whose good effects in this disease are so frequently mentioned as *opium*. One of the latest writers who speaks particularly in favor of relying chiefly on this narcotic, is Dr. Morrison. During eight years of practice at Demerara, where tetanus is of frequent occurrence, he employed it in a number of cases, and he declares, that in more than a dozen instances, the cure could be fairly attributed to this remedy.* Its good effects are however, not to be procured from small doses. It must be given in very large and repeated portions.† Dr. Morrison generally commenced with one hundred drops of laudanum, and increased each succeeding dose by thirty drops every two hours, until either sleep or stertorous breathing came on, when it was discontinued. The quantity of opium, which has been advantageously given in some instances, is indeed enormous. In Dr. Barr's case, referred to above, "a drachm of solid opium was given at once," on the third day of the disease, and after eighty-two ounces of blood had been abstracted. "In twenty minutes the patient began to dose a little, but not to sleep. In about an hour he fell asleep, shortly after which the breathing became slow and very laborious. In two hours he was roused, when he felt nausea, which was succeeded by full vomiting, which produced much relief. One slight spasm only afterwards occurred." The bowels should always be well evacuated by active cathartics and injections, previous to resorting to the opium. In traumatic tetanus, at least, copious venesection and leeching along the spine would appear to be an important preliminary or concomitant measure with the employment of opium. In most of the cases that have been reported in illustration of the good effects of copious bleeding, opium was freely administered.‡ The method of Stuitz, which in some parts of Europe has gained

* [In the only two cases of traumatic tetanus which I have successfully treated, I gave from 80 to 90 grs. of solid opium in conjunction with about half the quantity of calomel *per diem*, for several days in succession. In the case of young Mr Bockius, of Germantown, whom I attended in consultation with Dr. Runkel, sen., we first cut away the comminuted fragments of two metacarpal bones of the left hand, which had been shattered by the bursting of a gun, and dressed the wound with terebinthinates. We kept up irritation over the whole spine by frictions with tartar emetic and croton oil, and gave 82 to 86 grs. of opium a day for about two weeks, without producing any coma or oppression. The remedy appeared to expend all its powers in allaying the universal tetanic rigidity and spasms. We also rubbed mercurial ointment over the limbs, and gave calomel in combination with the opium until a moderate ptyalism was produced. The bowels were kept open by occasional doses of croton oil, and the strength was maintained by the liberal use of brandy with gruel. In a few days the wound began to suppurate and the rigidity and spasms disappeared. The patient has continued well for about twelve years.

The other case of a cure in tetanus to which I have alluded, was that of a house carpenter, Mr. M'Glathery, in North Fifth street, who was seized with universal rigidity and painful spasms on the ninth day after a deep puncture in the sole of one of his feet from a rusty nail. The wound was perfectly dry and more than an inch deep, when I laid it open and stimulated it with lunar caustic. It was then dressed with spirits of turpentine and basilicon. As he was cold and shivering, I continued the hot vapor bath, which a steam doctor had begun to apply, for many hours, and gave 3 grs. of opium and 5 of calomel every hour till an impression was made on the spasms. No narcotic impression was made, although I increased the doses to nearly 100 grains a day, occasionally. On an average he took full 60 grains of opium *per diem* for 12 days, and the calomel was aided by mercurial frictions until ptyalism was induced. The spine was at the same time irritated by blisters and tartar emetic ointment. He was supported throughout by the liberal use of brandy and gruel, with broths, and finally recovered perfectly. I am sorry to say, however, that all the other patients I have seen laboring under tetanus, from wounds, have died after every form of treatment.—Mc]

† A Treatise on Tetanus with Cases. Lond., 1815.

‡ Dr. Odier, of Geneva, says, "The best means for ascertaining whether the disease is tetanus, in doubtful cases, is to exhibit opium in gradually increasing doses. If the disease is tetanus, it will require an exceedingly large dose before its narcotic effects are manifested. But in cases

much celebrity, consists in the alternate use of opium and large doses of carbonate of potash, together with warm alkaline baths.* Bouchet, surgeon of the Hotel Dieu, at Lyons, gave one drachm of opium with three of carbonate of potash in 24 hours with complete success in traumatic tetanus. In a recent number of Hufeland's Journal,† an instance of traumatic tetanus is related, in which this mode of treatment, with a copious blood-letting in the commencement, was used with the happiest effect. The method, however, no doubt, derives its powers chiefly, if not wholly, from the opium and warm bathing. Applied externally, the acetate of morphium has been employed with marked success, in this affection. Dr. Jos. Cerioli, of Cremona, has related a case of traumatic tetanus, which, "after copious blood-letting and the use of large doses of morphine *internally*, together with the warm bath, and stimulating frictions along the spine, without any advantage, yielded, very soon, to the *external* application of morphine. About ten days after the commencement of the disease, the cuticle was removed from the neck, by means of an epispastic. Some acetate of morphium was then applied to the part, and repeated in about six hours." The effect produced by this application, was extremely remarkable; in a few hours the clonic spasms were weaker, the motion of the jaw more free, the contraction of the lineaments of the face became relaxed, the pains of the neck and back had diminished sensibly, the sufferer enjoyed a tranquil sleep, with slight occasional interruption. By the continued application of this narcotic, the patient was finally entirely relieved of the complaint, without any other remedy.‡

Mercury, also, has been a good deal employed, and according to respectable authorities, with decided advantage in tetanus. Dr. Walther, in a memoir on the use of mercury in this affection, declares that from successful experience, he is led to regard this remedy as among the most valuable means we possess for the cure of tetanus. In the *Medical Essays* and Observations of a Society in Edinburgh, published a century ago, Dr. Donald Monro states, that a gentleman in Jamaica had cured twelve cases of tetanus in succession "by placing his patients in a very warm room, and then rubbing in large quantities of mercurial ointment over the limbs and body until ptyalism was raised. This, with *large doses of opium*, was the only means used. Dr. A. Monro, of Edinburgh, tried the same plan in a case of traumatic tetanus, and with complete success."§ Larrey, however, states, that mercurial frictions during the French campaigns in Egpyt, almost uniformly did harm. Dr. Rush cured a case in the Pennsylvania Hospital by copious salivation, assisted by bark and wine. It would appear from the observations that have been published on this point, that ptyalism is much more apt to do good in idiopathic than in traumatic tetanus. Dr. Morrison states, that he met "with many examples of the beneficial effects of mercury in this disease, and as it does not interfere with other remedies, the free administration of mercury, he says, ought never to be omitted."

Wine and other alcoholic liquors, though apparently directly contra-indicated, have been much used, and successfully too, in tetanus. In conjunction with bark, mercury, and irritating applications to the wound, *wine* was a favorite remedy in this affection with Dr. Rush. "Wine," he says, "should be given in quarts and even gallons daily." Dr. Currie cured a case in the Liverpool infirmary; the patient having drunk, in a short time, "nearly a quarter cask of Madeira wine;" and Dr. Hosack has published observations illustrative of the beneficial effects of this stimulant in tetanus.‖ In the *London Medical and Physical Journal* for March 1825, Dr. Nicholls has reported a case of incipient

that simulate tetanus, as is sometimes the case with hysteria, this narcotic evinces its powers much more readily and energetically."—*Manuel de Médecine Pratique*, p. 189.

* Stuitz, ueber den Wundstarr Krampf, Hufeland's Journal, bd. xviii. st. iv. p. 5.

† October, 1827.

‡ London Med. and Phys. Journ., from the Annali Universali di Med, May 1829.

§ Med.-Chir. Rev., vol. x. p. 304.

‖ New York Med. Repos., vol. iii. p. 22.

traumatic tetanus which was successfully treated by the administration of wine, laudanum, bark, and steel, with ammonia and nourishing diet.

Various other stimulants have been employed in tetanus. The *spirits of turpentine*, in particular, has of late years attracted considerable attention as a remedy in this disease. Dr. Hutchinson gave it in a case of idiopathic tetanus, in an epileptic subject, with complete success.* A similar case is related by Dr. William Tamis, which yielded to the internal administration of this article.† Dr. Mott, of New York, has given an account of a case of traumatic tetanus, which was cured by the spirits of turpentine after the disease had resisted the influence of the cold and warm bath, tobacco, opium, bark, wine, and blisters to the spine. A teaspoonful of the turpentine was given every fifteen minutes for two hours, when the spasms intermitted. It was afterwards repeated at longer intervals, until one hundred and twenty-three teaspoonfuls were taken.‡

Tobacco was recommended for the cure of this disease by Dr. Edmund Gardener as early as the beginning of the eighteenth century. It has lately been a good deal employed, and no inconsiderable number of instances have been published illustrative of its good effects. Dr. O'Beirne's case, related in the third volume of the *Dublin Hospital Reports*, is an interesting example of the occasional beneficial influence of tobacco in tetanus. Tobacco enemata (a scruple of tobacco to a pint of boiling water) were employed at longer or shorter intervals, for fifteen days in succession, and the disease was thereby completely overcome. Dr. Anderson, who practiced at Trinidad, has reported three cases of traumatic and idiopathic tetanus which yielded under the employment of the tobacco.§ He directed the jaws, throat and chest to be fomented for half an hour at a time by a strong decoction of fresh tobacco leaves. After the fomentations, cataplasms of tobacco were applied to the jaws and throat. The warm bath, into which some tobacco was thrown, was also used every three hours, and a tobacco enema administered every twelve hours. The trismus did not yield until the third day, when the jaws became a little relaxed, and under the same treatment the patients gradually recovered. Lefoulon also employed this powerful narcotic with success in tetanus;‖ and Dr. Norcom cured a case by the simultaneous employment of opium internally and tobacco clysters.¶

The *prussic acid* would appear to possess very considerable remedial powers in this affection. Dr. Trezevant, of Columbia, South Carolina, has given the history of a case, which strongly illustrates the beneficial tendency of this potent remedy in tetanus.** It appeared, also, highly useful in a case treated successfully by Professor Pattison, in which it was freely used, in conjunction with the application of caustics along the spine. Various other internal remedies have been given with more or less benefit in tetanus. Dr. Brown exhibited the tincture of *cantharides* in large doses with success; and Dr. Elliotson has published some observations, which go to show that considerable advantage may occasionally be derived from very large doses (℥ss) of the subcarbonate of iron.††

The external employment of *cold water*, either by affusions or the plunging bath, is one of the oldest remedies employed in tetanus.‡‡ Dr. Wright was the first, in modern times, who directed the attention of the profession particularly to the employment of cold affusions in this affection.§§ His observations were

* Lond. Med. and Phys. Journ., No. cclxxxviii. † Ibid., for May 1823.

‡ New York Med. and Phys. Journ., vol. ii. p. 388.

§ Transact. of the Med.-Chir. Society of Edinburgh, vol. i. and vol. ii.

‖ Harles' Neue Journ. d. Med. Chir. Leter, b. vi. No. ii.

¶ Philadelphia Journal of Med. and Phys. Sciences. [I tried the tobacco injection in a case of Dr. Goldsmith's in Kensington, and repeated it till we produced complete relaxation of the spasms, and prostration of the forces. For a season we were gratified with hopes of a cure, but in a few hours the spasms recurred and the patient died.—Mc.]

** Medical Recorder, vol. v., October 1825.

†† Med.-Chir. Trans., vol. xv. part i.

‡‡ Hippocrates, lib. iv. sect. v. aph. 2, et lib. v. sect. ii. aph. 21. Avicenna, lib. iii. cap. 7.

§§ Lond. Med. Observ. and Inquir., vol. vi.

soon followed by those of Cochran,* and Currie, who fully confirmed the favorable accounts he had given of its effects. Dr. Rush also obtained decided advantages from cold affusions in this disease. The only fortunate case I have ever witnessed was treated by mercury, opium, and very frequent cold affusions. The *warm bath*, also, has been frequently employed in the treatment of tetanus. Richter observes, that the warm bath seldom fails to procure at least temporary mitigation of the symptoms. Dr. Morrison speaks favorably of the effects of warm bathing in tetanus; but the exertion, he says, which the patient must undergo to get in and out of the bath, sometimes does more harm than can be counterbalanced by this measure. "Patients (he observes) are so alive to all external impressions, that the least exertion is often sufficient to excite violent spasms. On this account, the patient should be kept as quiet as possible, and very few questions asked, and everything tending to excite mental exertion avoided." It must be observed, moreover, that according to the experience of some practitioners, much mischief has resulted from the use of the warm bath in tetanus, independent of the exertion which it requires. Dr. Hillary states that he has known instantaneous death to follow warm bathing in this disease. This, however, may be affirmed of perhaps every important remedy that has been administered in tetanus.

From what has been said above concerning the pathology of tetanus, no remedies appear to be more clearly indicated than external irritating applications along the track of the spine. This is, indeed, an old practice. Celsus lays particular stress on the assiduous employment of frictions and rubefacients over the vertebral column;† and if these are insufficient, he advises the application of cups; or, finally, the *actual cautery* over the vertebræ of the neck. Dr. William Carter, among modern writers, is, I believe, the first who employed blisters along the whole course of the spine in this affection. He has published a case which was successfully treated by blistering in this manner, with the occasional use of an active cathartic.‡ Several other cases are extant, illustrative of the good effects of this practice.

A much more powerful and prompt means of this kind is the *caustic potash*. Dr. Hartshorne, of this city, was, I believe, the first who applied this caustic over the spine for the cure of this affection. He has reported a case which yielded completely under the employment of this application, together with the internal use of opium, ether, brandy, and extract of stramonium, in large doses. In this case the good effects of the caustic were unequivocal. The internal remedies, just mentioned, had been employed for several days without any advantage. The caustic was at last applied over the cervical vertebræ, and in about two hours afterwards a diminution of all the tetanic symptoms had already taken place.§ A case, equally satisfactory, in relation to this practice, is related by Dr. T. Thomas, of Easton, Maryland. After wine, mercurial frictions, and opium, had been ineffectually employed, the caustic potash was applied over the course of the cervical vertebræ. "The effect," says Dr. T., "was really delightful; the new action excited by the caustic destroyed completely the morbid action of the system; the spasms ceased, and in one hour the patient appeared free from disease.‖ Many other cases have since been published, demonstrating the beneficial effects of this practice.¶ I have already referred to the recommendation of the actual

* Med. and Philosoph. Comment., vol. iii.

† Fricatio cum omnibus vertebris, hominum utilis sit, tum iis præcipue, quæ in collo sunt. Ergo die nocteque, interpositis tamen quibusdam temporibus, hoc remedio utendum est: dum intermittitur imponendum malagama aliquod ex calefacientibus. Si vero etiam vehementius dolor crevit, admovendæ cervicibus cucurbituriæ sunt, sic ut cutis incidatur. Eadem aut ferramentis aut sinapi adurenda. Celsus, de Medicina, lib. iv. cap. iii.

‡ Med. Transact. of the Lond. College of Physicians, &c., vol. ii. p. 34.

§ Eclectic Repertory, vol. ii. p. 245.

‖ Ibid.

¶ Dr. Worthington, (Medical Recorder, vol. iii. p. 527.) Dr. Joel Lewis, (ibid., p. 176.) Professor Potter, of Baltimore.

cautery to the region of the cervical vertebræ, in this disease, by Celsus. In modern times, Mursinna has resorted to this measure with almost instantaneous mitigation of the symptoms. Dr. M'Clellan also employed it in one instance with unequivocal benefit. The application of moxas, along the spine, might, no doubt, be used with advantage.

From all that has been said concerning the treatment of tetanus, it appears manifest, therefore, that copious bleeding, leeching, and cupping, along the spinal region, mercury, large doses of opium, tobacco enemata, active purgatives, the free use of wine, and caustic applications over the cervical and dorsal vertebræ, constitute the most important curative means in this affection.

Sect. X.—*Hydrophobia.*

Hydrophobia is one of the most ancient diseases.* The first distinct account, however, which was given of this terrific malady, is to be found in the writings of Cœlius Aurelianus.† Celsus speaks of it as a disease well known before his time.

In the human species, hydrophobia has never, so far as is known, arisen from general causes. In man it is always the result of a specific virus or contagion derived from an animal laboring under the disease. The hydrophobic virus appears to be exclusively attached to the saliva: and hence almost the only mode in which it is propagated is by wounds inflicted with the teeth of a rabid animal. Without doubt, however, the disease may be communicated by bringing the contagious virus in contact with an excoriated or wounded surface in any manner. This has, indeed, been verified by direct experiment. Magendie and Breschet inoculated two dogs with the saliva of a rabid man. One of these dogs became rabid, and bit two others, which also became mad. Instances have, moreover, been recorded of the propagation of hydrophobia by the accidental contact of the morbid saliva with wounds, or excoriations on the lips, hands, or other exposed parts of the body.‡

In the dog, fox, and wolf, and in the domestic cat, and perhaps in some other animals, hydrophobia is sometimes developed by causes of a general character, independent of a contagious principle. By what particular influences the disease may be generated without the agency of a contagion, is, however, as yet, in a great degree, a matter of conjecture. It has been supposed that intense cold and high atmospheric temperature have a particular tendency to promote the development of this affection. Experience does not sustain this opinion sufficiently to entitle it to especial credit. It is, indeed, true, that in our own climate, canine rabies is, in general, of much more frequent occurrence during the hot months of summer than in any other season of the year; yet in some extremely warm and cold countries, this disease is said to be entirely unknown, or, at most, exceedingly uncommon.

In South America, Egypt,§ Syria, the West Indies, Sweden, and Kamschatka,‖

* Among the ancient Egyptians, *rabies canina* appears to have been known, and ascribed to a disease of the spleen. Horapollo (Hieroglyphica, i. 39) says, σπλῆνα δὲ, ἐπειδὴ τοῦτο τὸ ζῶον μόνον παρὰ τὰ ἕτερα ἐλαφρότερον ἔχει εἴτε (δὲ) θάνατος αὐτῷ, εἴτε μανία περιπέσοι, ἀπὸ τοῦ σπληνός γίνεται.—*Origines Contagii. Auctore Dr. C. F. H. Marx.*

Homer, also, in several places, refers to this disease. Thus Tencer calls Hector a mad dog:

Τοῦτον δ' οὐ δύναμαι βαλλέειν κύνα λυσσητῆρα.—*Iliad*, lib. viii. v. 299.

At Argos there was anciently an annual festival, called *Cyrocephantes*, during which, all the dogs that were running at large were killed.—*Gorrey, Sur la Rage. Journ. de Médecine*, t. xiii. p. 93.

† De Morb. Acut., p. 206, edit. 1722, as quoted by Van Swieten.

‡ Callisen in Collect. Societ. Med. Havn., vol. i. ob. 32. Gruner's Almanach fuir Aerzte, 1786, p. 184. Salzb. Med.-Chir. Zeitung, 1795, b. iii. p. 80.

§ Le Cointre, Journ de Med., tom. vi. p. 265, as quoted by Richter.

‖ Langsdorf's Reisen., b. ii. p. 443.

hydrophobia, we are told, has been rarely, if ever, known to occur. Its spontaneous occurrence has also been thought to be particularly favored by certain occult atmospheric constitutions; and this opinion is countenanced by the fact that the disease has been known to occur at certain times and places in an epidemic manner.* Besides these presumed occasional or predisposing causes of hydrophobia, it has been alleged that putrid food, the protracted want of food and drink, unsatisfied venereal passion,† and violent rage, are capable of originating this affection. Dr. Mease states that a number of dogs fed upon the carcasses of horses that were left unburied near this city, and that many of them soon afterwards became affected with rabies. Rougemont relates similar examples of the apparent generation of this affection by putrid animal food. On the other hand, however, it has been observed, that the dogs that crowd the streets of Constantinople feed almost exclusively on putrid animal substances, and yet hydrophobia is said to be almost wholly unknown at that place. "Putridity," says Dr. Good, "is perhaps the ordinary state in which dogs and cats obtain the offal, on which for the most part they feed: they show no disgust to it, and it offers a cause far too general for the purpose." With regard to the want of food and drink, as a cause of hydrophobia, Richter states, that in hot climates dogs have been known to perish for want of water, without having been seized with rabies. Direct experiments, too, have been made by confining dogs, both during very warm and cold seasons, and allowing them nothing but water without food, or salted and putrid meats, but no drink, without any of them becoming affected with this disease.‡

It is nevertheless probable that these causes, though not of themselves capable of producing this disease, co-operate often with other influences in exciting its development. With regard to the tendency of violent rage to impart properties to the saliva of certain animals, capable of producing affections very similar, or as some assert, identical with hydrophobia, many confirmatory observations are extant. Lister mentions an instance of fatal hydrophobia produced by the bite of an enraged dog,§ and similar cases are related by Drs. Parkinson and Linguet.‖ The bite of an enraged cat, also, has been known to give rise to fatal rabies in the human species. Rossi gives an account of three cases of this kind.¶ Weikard states that a woman, in separating two fighting fowls, was bit by one of them, from which she became affected with fatal hydrophobia;** and Le Cat mentions a similar event from the bite of an enraged duck.†† The instances in which affections simulating hydrophobia have arisen from the bite of infuriated men, are by no means very rare. Van Swieten mentions a case of this kind,‡‡ and other examples are related by Weikard, Meekreen, Wolff, and Zacutus Lusitanus, as cases of genuine rabies.

It is not improbable, however, that many of the reputed cases of hydrophobia, said to have arisen from injuries of this kind, were in reality peculiar forms of tetanic affections; for the dread of water, which has been generally regarded as pathognomonic of rabies, has been frequently known to occur in cases unequivocally tetanic.

The contagion of rabies belongs to the palpable or fixed morbid animal passions; and does not admit of being diffused in the atmosphere—at least not in such a state as to retain its power of affecting. It would seem, however, to retain the power of affecting the system a very long time after it is generated. Cases are related in which the saliva of hydrophobic patients adhering to clothes, has given rise to the disease in persons who afterwards were employed to clean

* Fehr. Etwas Ueber d. Hundswuth. Mease on Hydrophobia.
† Hildenbrand, Ein Wink zur Nachern Kenntniss u. Heilung d. Hundswuth, p. 4.
‡ Ribbe. Natur. u. Medic. Geschichte der Hundswuth Krankheit.
§ Tract. de Quibusd. Morb. Chronic., p. 43.
‖ Journ. Politique, No. 1775, quoted by Richter.
¶ Turiner Med. Abhand., 1802.
** Philosoph. Arzt. s. iv. p. 186, quoted by Richter.
†† Recueil Periodique, ii. p. 90.
‡‡ Commentaries, § 1130.

or mend them. Richter mentions the case of a woman who became affected with rabies in consequence of having mended a garment that was torn by the bite of a rabid dog.*

The period which intervenes between the insertion of the contagion of rabies and the commencement of the disease, is exceedingly various. It very rarely appears before the end of the third week, and in some instances the contagion remains dormant for six, nine, or even twelve months before its effects are manifested. From forty to sixty days may be regarded as by far the most common latent period of this contagion. Dr. Dickson states, that of seventeen persons who were bitten by the same dog, ten became affected with the disease at different periods from the fifteenth to the sixty-eighth day after the infliction of the bites.† Instances, indeed, have been noticed, in which the disease came on as early as twenty-four hours after the bite of a rabid dog; and Boudot mentions a case which supervened during the first night.‡ It is exceedingly doubtful, however, whether these cases were truly hydrophobic. The alarm occasioned by the bite of a rabid dog, may of itself be sufficient to cause spasmodic and nervous symptoms, simulating this disease, in persons of nervous temperaments. Authors, moreover, mention cases which did not supervene until several years after receiving the hydrophobic contagion; but the instances which are related as having occurred eighteen, *twenty*, and even *forty*§ years after the insertion of the virus, require an effort of faith which few, I presume, are willing to exercise. There is, however, a very remarkable and well authenticated case related, of a woman who had been bitten by a mad dog, and in whom the wounded part inflamed and broke open every spring for eighteen years in succession. In the spring of the nineteenth year, the part became red and painful, without opening, and the immediate consequence was furious mania, with an insurmountable horror of water. By the application of blisters to the affected part, blood-letting, and mercurial purgatives, she was cured.‖

Without doubt, however, the occurrence of this affection after the infliction of a bite from a rabid animal, may be promoted by the alarm and mental anxiety which an accident of this kind always excites to a greater or less degree. It would appear also that violent anger or vehement mental emotions, of every kind, and from whatever cause they may arise, have no inconsiderable tendency to hasten the occurrence of this affection after its contagion has been introduced into the system. Observations would seem to show, too, that high atmospheric temperature has a similar tendency of promoting the activity of this contagion. It is said that the disease almost invariably comes on much earlier in hot climates than in the temperate latitudes. Richter mentions the free use of spirituous drinks and inordinate venereal indulgences, as causes capable of hastening the supervention of the disease.¶ Several very striking examples, illustrative of the influence of the latter cause in this way, are mentioned by Rougemont. It is a fortunate circumstance, that the bite of a rabid animal is by no means generally followed by hydrophobia. The predisposition to the morbific influence of this contagion does not appear to be very strong in the human species; and in many instances an entire insusceptibility seems to exist to its operation. It is from this cause, in part, at least, that we sometimes find only one or two out of a number of individuals bitten by the same dog, become rabid. Without doubt, too, the circumstances attending the infliction of the bite, often have a particular agency in hastening, retarding, or preventing the occurrence of the disease. When the animal bites through clothes, more especially woolens, the virus is probably often so completely wiped from the teeth before they penetrate the skin, as to prevent infection.

* Specielle Thérapie, bd. viii. p. 378. † Med. Observ. and Inquiries, vol. iii. art. 34.
‡ Essais Antihydrophobique, 1771, p. 121—Richter.
§ Rougemont, loc. cit., p. 123. ‖ Richter's Chirurg. Biblioth, b. v. p. 686.
¶ Act. Reg. Soc. Med. Hav., vol. ii. p. 408—Richter.

It has already been observed, that in the human subject hydrophobia, or genuine rabies, appears to have but one origin; namely, the application of the hydrophobic contagion to a raw or excoriated surface. It has, nevertheless, been asserted, that unequivocal rabies has occurred in the human species without the agency of a specific virus; and Richter, as well as many other respectable authorities, are inclined to admit the possibility of such an occurrence. Mangor gives an account of an instance, where a melancholic man became affected with hydrophobia wholly unconnected with contagion, of which he died on the sixth day. His wife, who, during the course of the disease, frequently kissed him, also became affected with the disease and died of it on the fifth day.

Dr. Barth has related a very remarkable case of hydrophobia which was excited by cold. The patient, a man about forty years old, was subject to hemorrhoids, hypochondriasis and profuse sweating of the feet. He bathed his feet in cold water, and in a few hours afterwards was seized with violent general spasms of the clonic character. The skin of the body was icy cold to the touch. The spasm occurred every eight or ten minutes, and continued about a minute. Among other things, the patient was ordered to drink warm elder tea; "but the moment the patient attempted to drink, he was suddenly seized with a most violent spasm of the throat and pharynx, and the fluid was immediately thrown out of the mouth; the eyes were convulsively distorted; the neck became frightfully distended, and the head thrown backward; the chest and the abdomen were raised from the bed while the hands and feet moved convulsively, and a hoarse sound, like that made by persons suffocating, was uttered by the patient." The disease yielded to sinapisms, antispasmodic injections, warm pediluvia, and stimulating frictions. (*Rust's Magaz.*, vol. 27, No. 1, 1828.)

Symptomatic affections closely simulating hydrophobia are not very uncommon. A dread of water—exciting spasms and feelings of indescribable horror when attempts are made to drink—has been frequently noticed as an accidental occurrence in various diseases. Inflammation of the brain, uterus, and particularly of the heart, and of the cardiac extremity of the stomach, are most apt to become complicated with hydrophobic symptoms. Nervous affections, more especially hysteria and hypochondriasis, may also assume the phenomena of rabies; and instances are mentioned, in which mania and epileptic paroxysms have terminated in symptoms of hydrophobia.* The narcotic poisons—particularly stramonium, belladonna, and aconitum—have been known to produce spurious hydrophobia;† and it has been the consequence of suppressed menstruation by violent mental emotions. (Richter.) Malignant and other violent forms of fever are sometimes attended, in the advanced period of their course, with many of the characteristic symptoms of rabies. Schmucker relates a case of dropsy, in which the "water-dread" was for a time as strongly manifested as it usually is in genuine hydrophobia; and Frank saw an instance of its occurrence in diabetes.‡ In the last stage of pulmonary consumption, in hepatic obstructions, in jaundice, and in other chronic visceral affections, hydrophobic symptoms have been known to occur; and the occurrence of phenomena of this kind in tetanus is far from being uncommon.

Symptoms.—In nearly all instances of this affection, certain local and general premonitory symptoms occur for a longer or shorter period previous to the appearance of the characteristic phenomena of the disease. If the wound by which the contagion was communicated, be not yet fully closed, it assumes a more or less livid appearance, with raised and inflamed edges, and begins to discharge a thin ichorous matter a few days before the accession of the proper hydrophobic symptoms. Where cicatrization has been fully completed before the disease begins to develop itself, the cicatrix generally becomes slightly elevated, painful, inflamed,

* Richter, Specielle Thérapie, b. viii. p. 197.
† Harles, Ueb. d. Behandl. d. Hundswuth, p. 72.
‡ Epitom., &c., lib. v. p. i. p. 54.

and finally often opens, forming an ill-looking ulcer with elevated borders, from which a thin, acrid and offensive matter is discharged. The pain in the affected part is often very severe; and sometimes gradually extends itself throughout the whole limb. It is said, that the pain in passing inwards from the part that was bitten, always proceeds along the course of the nerves towards their origin. Sometimes, however, little or no inflammation and pain in the injured part are noticed before the accession of the disease, with the exception usually of an occasional transient stinging sensation in the cicatrix. In some instances the patient experiences a peculiar torpor and numbness of the injured extremity.

The *general* premonitory symptoms consist usually in lassitude, muscular prostration, indisposition to corporeal and mental exertion, flushes of heat alternating with transient sensations of chilliness, nausea, sometimes bilious vomiting, thirst, constipation, want of appetite, anxious respiration, and, in general, all the symptoms which usually precede the development of febrile diseases.* In some cases a constrictive sense of pain is felt in the extremities, passing generally from the wounded part, and finally fixing itself in the head. (Richter.) The sleep is commonly disturbed by alarming dreams, and attended with slight spasms of particular muscles, and twitching of the tendons. The temper is almost invariably prominently affected shortly before the invasion of the disease. The patient is unusually reserved, suspicious, taciturn, and tormented with gloomy forebodings; sometimes, though indeed seldom, he is animated and talkative. There is commonly an extreme degree of sensibility and repugnance to the impressions of cool air. In men, the desire for venery is often almost irresistible a short time before the disease comes on, and Hamilton states that the scrotum is usually very strongly, and, as it were, spasmodically contracted.

These precursory symptoms sometimes continue for seven or eight days before the actual occurrence of the disease; but their ordinary duration varies from two to four or five days. Occasionally, indeed, no premonitory symptoms whatever are noticed before the accession of the disease.

The only symptom which is never wholly absent in this disease, as it affects the human species, is the extraordinary dread or horror of liquids—more especially of water. Patients laboring under rabies may, indeed, sometimes experience a temporary abatement or even absence of this torturing symptom, but in all instances it occurs in a greater or less degree, and generally remains throughout the whole course of the malady. In general, the mere sight of liquids, or the sound of pouring water from one vessel into another, brings on violent suffocative spasms; and the attempt to swallow water or to bring it to the lips, commonly excites a degree of horror and agitation truly frightful. Even the sight of polished surfaces, as of a mirror, or the rustling sound of bed curtains, of currents of air, or of running water, will, in the more violent grades of the disease, immediately renew the spasms and feeling of horror. Occasionally, however, this extraordinary horror is manifested only against *water;* for patients have been known to take small portions of other fluids, as of soups, milk, and wine, in a lukewarm state. The thirst is always extremely urgent, and though the suffering from this source is generally very great, the patient dares not attempt to swallow any liquids. The secretion of saliva is profuse, and from an inability to swallow it, the patient continually spits it out in every direction, "often desiring those around him to stand aside, as conscious that he might thereby injure them." During the whole course of the disease occasional remissions occur. Whilst these continue, the patient often appears calm, talks deliberately about his feelings or his affairs, and cautions those who are about him not to approach him too closely when under the paroxysm of madness, lest he should injure them. Notwithstanding this partial calm, there are always a peculiar wildness and appearance of alarm in the expression of the countenance; the motions are quick and hurried; the eyes cast about with an air of suspicion; and if the patient

* Richter, loc. cit., p. 129.

attempts to lie down and obtain some rest, he usually soon starts up again with great agitation and anguish of feeling. During the exacerbations, the expression of the countenance is wild, furious, agitated, and agonized; the eyes are blood-shot, sparkling, projecting, and expressive of rage and terror; the muscles of the face, throat, chest, and sometimes the extremities, are thrown into spasms; respiration is interrupted or convulsive; the arms are thrown about; the fists clenched; the teeth violently gnashed; the mouth foaming; with an unconquerable disposition to bite everything that comes within the patient's reach. In violent paroxysms, furious and maniacal raving occurs, attended often with an entire absence of consciousness. These paroxysms usually last from about fifteen to thirty minutes. Many patients, however, do not become furious or maniacal during the spasmodic exacerbations, and retain almost the full command of their mental powers, from the commencement to the fatal close of the malady. In some instances a tormenting degree of salacity is experienced during the intermissions, attended with continual painful erections, and occasional involuntary discharges of semen. Patients affected with rabies generally walk about through the room, or remain sitting up as long as their strength admits of this effort, for the horizontal posture is almost always borne with much difficulty.

Hydrophobia is very rarely attended by distinct febrile symptoms, except sometimes towards the conclusion of the disease. At first the pulse generally does not materially differ from its natural condition; but in the latter periods of the complaint it always becomes small, irregular, weak, and very frequent. The eyes are in general very sensible to light; and the countenance is pale during the remissions, but turgid and flushed during the paroxysms. Some patients are from time to time affected with vomiting, attended with a burning heat in the pit of the stomach. The morbid sensibility to the impressions of low temperature, which occurs generally among the premonitory symptoms, often rises to an extreme degree during the course of the disease. Towards the termination of the malady, the tongue becomes rough, harsh, chapped, and often aphthous. The surface of the body is usually constricted and dry, the bowels constipated, and the blood drawn from a vein often dissolved and very fluid. (Richter.) The duration of hydrophobia is fortunately not long. Most patients die as early as the second or third day of the disease. It is rarely protracted beyond the fifth or sixth day; although instances have occurred which did not terminate under fourteen or fifteen days.

Post-mortem appearances.—The morbid phenomena, detected by dissection, in those who die of hydrophobia, are extremely various in different cases, and throw but very little or no light on the true nature of this affection. It is said that the process of decomposition often commences very early after death, and proceeds with great rapidity.* The surface of the body is usually of a livid redness, and the muscles, and particularly the tendons, are unusually rigid. Strong vascular congestion of the meninges and brain, with serous or sero-sanguineous effusion between the membranes and into the ventricles, are among the most common phenomena. In some instances, the brain has been found unusually firm and dry (Morgagni); in others extremely soft. The mucous membrane of the mouth and fauces, and particularly about the glottis, is usually inflamed, and sometimes considerably tumefied or œdematous. In some instances, however, these parts did not exhibit any material deviation from their natural condition (Morgagni, Vaughan); in others, instead of inflammation, the mucous membrane of the mouth and fauces was of a rose-red color, with a varicose dilatation of some of its blood-vessels.† The cervical ganglia have been found inflamed. The lungs are often greatly engorged with blood, and their mucous membrane irritated or inflamed. In some cases the mucous tissue of the stomach and

* Sauvages—De la Rage. Morgagni; De Sedeb. et Caus. Morbor., lib. ii. art. xix.

† Krukenberg, as quoted by Richter.

bowels exhibits evident marks of previous inflammation; and the same phenomena are occasionally met with in one or more of the abdominal viscera. Metzler, Benedict, Gherardini, and Autenreith have found the nerves leading from the wounded part manifestly inflamed to a considerable extent of their course. It must be observed, however, that many instances have been reported in which scarcely any morbid appearances whatever were detected on post-mortem examination.

With regard to the proximate cause or pathology of hydrophobia, there is but very little, or nothing, known of a satisfactory character. The very numerous opinions that have been expressed upon this subject, resolves themselves into: 1, those which regard the *sanguiferous system* as the primary location of the disease, viewing it as essentially an inflammatory affection: and 2, those which place the essential irritation exclusively in the *nervous system*. The general sentiment, at present, is in favor of the latter doctrine; but there exists nothing beyond plausible conjecture and hypothesis, with regard to the particular character of the nervous affection, or the portion of the nervous system chiefly implicated. Without entering into any discussion on this obscure subject, it may be observed, that although the essential phenomena of the disease point unequivocally to a morbid condition of the brain and nerves, we have equally conclusive evidence that the arterial system is in a state of morbid excitement; for without diseased vascular action there could be no hydrophobic virus secreted. The opinion, however, that it is an inflammatory affection, is certainly not sustained by the symptoms of the disease. That local inflammation should sometimes occur during the progress of the malady, is indeed to be expected; but even this occurrence does not appear to be so common as has been asserted; for many of the repeated examples of local inflammation, were probably merely instances of strong vascular injection or engorgement, with its occasional consequent serous effusion, produced either during the course of the disease, or in articulo mortis. Rabies is, I presume, essentially a *cerebral* affection. The peculiar dread of liquids, the paroxysms of fury, or mental agitation, spasms, and general feelings of anguish and alarm, without any manifest febrile symptoms, all indicate that the disease is essentially connected with, or dependent on, a morbid excitement or condition of the brain, independently, it would seem, of diseased vascular action or phlogosis.

Treatment.—After all that has been said and done in relation to the nature and remedial treatment of rabies, there is, perhaps, no other affection which is so decidedly beyond the control of all the resources of our art as this appalling malady. That it is essentially an incurable disease cannot, indeed, be affirmed; for however unsuccessful the efforts of physicians may hitherto have been, there is certainly nothing in its characteristic phenomena, which should lead us to assert that it is necessarily fatal, or to abandon the hope that some mode of management or remedy may yet be discovered, capable of arresting its progress. Indeed, unless we discredit the authority or judgment of several physicians of good repute, we must admit that instances of genuine hydrophobia have been successfully subdued by remedial treatment. Unfortunately, however, such favorable results have been so exceedingly rare, that they can scarcely sanction any expectations of advantage from remedial applications, after the disease has made its appearance.

Our reliance must, therefore, be entirely placed in the prompt and energetic employment of *prophylactic* measures; and for this purpose, *local applications* to the wound, with the view of preventing the absorption of the hydrophobic virus, are decidedly the most efficient remedies.

As soon as possible after the infliction of the bite, the wound and surrounding surface should be carefully washed with warm, or, as Hunter recommends, cold water; and immediate efforts made to prevent the further passage of the virus into the system. If the bite be of a character, and in a part which admits of its entire

excision, this, if speedily done, affords undoubtedly the most certain protection against the occurrence of the disease.*

If the bite be on the hand, particularly when the teeth of the animal have penetrated deeply between the bones, it will be best to amputate; and this is especially proper if only the fingers are wounded. Some have preferred destroying the wounded part with the *actual cautery*, and there can be no doubt of the efficiency of this measure, if employed soon after the bite has been received. The free application of caustic potash may also be resorted to with success where the wound is superficial; but where it has penetrated deeply, it cannot supply the place of excision, or the actual cautery. In slight wounds, the application of cupping glasses, as is recommended by Dr. Barry, for the purpose of arresting the effects of poisoned wounds, would, perhaps in most cases, be sufficient to prevent the occurrence of rabies. Dr. Good "strenuously recommends the immediate application of a tight ligature to the affected part, a short distance above the wound, if its situation will admit of it."

Besides these local measures, *which alone deserve our confidence*, a vast variety of internal remedies have been recommended, with the view of counteracting the hydrophobic virus. Of all other diseases, indeed, rabies has afforded the widest scope for empiricism and charlatanry. Innumerable remedies have, at different times, been lauded as infallible preventives of this affection; but sad experience has hitherto nullified all these pretended specifics.

The most celebrated of these remedies is *belladonna*. This article was first used by Mayerne. Munch asserts, that in 176 instances the occurrence of the disease was prevented by this medicine;† and we have the authority of Stark, Jahn, Bucholz,‡ Sauter,§ and Hufeland,‖ in favor of its prophylactic powers against this affection. *Anagalis arvensis.*—This is one of the oldest remedies for the prevention of rabies. Both Galen and Ætius recommend it for this purpose. It formed the basis of several celebrated nostrums, formerly vended in this country; and its powers have been particularly extolled by Ravenstein, Cartheuser,¶ Chabert, Ribbe, Stoeller, and other writers on this disease. *Lichen cinereus* constituted the principal ingredient in the *pulvis antilyssus* of Dambiere.** The celebrated Mead asserts, that in more than one hundred instances, he prevented the disease by this remedy.

The water plantain (*alisma plantago*) has, of late years, attracted much attention as a prophylactic remedy in this affection. It was first employed in Russia; and many respectable names might be cited in favor of its powers in this respect. The powdered root or bulb is given in doses of from a scruple to a drachm once daily. The root, it is said, should be collected about the latter end of August. The *scutellaria lateriflora* is fresh in the recollection of every one, as a highly boasted preventive of this malady. Like other articles of this kind it has had its day; and there are probably now very few, if any, physicians, who would place the least reliance on its powers—as it certainly does not appear to deserve any con-

* [By a free excision of the wound after the bite of a rabid dog, I have prevented hydrophobia in every case to which I have been called before the access of a paroxysm. I pinch up the integuments as deeply as possible between the left thumb and fingers, and shave out all the parts around and below the wound, if it be a superficial one, and then dissect out the bottom, if it be a deep-seated one. A cupping glass over the wound and a ligature above it will then promote a sufficient hemorrhage to discharge all the virus. Under this treatment, Mr. Robeno, a tailor, in Southwark, escaped after two severe bites on the outside of the calf of one of his legs —when a woman, who had been bitten just before by the same dog in the same street on one of her hands, was seized a week afterwards with a fatal hydrophobia. My friends, the two Dr. Klapps, treated her by the ligature and caustic, and also by the plentiful use of the decoction of scutellaria.—Mc.]

† Dissert. de Belladonna Efficaci in Rabie Canina Remedio.

‡ Hufeland's Journal, bd. v. p. 378.

§ Ibid., bd. vi. p. 679.

‖ Ibid., bd. xvi. p. 113.

¶ Fundamenta Materia Medica.

** Two drachms of this substance, with half an ounce of black pepper, were given every morning for four days in succession, in a cup of warm milk; and the patient directed to use the warm bath daily for a month afterwards.

fidence whatever.* Boerhaave, Erpenbeck, Moneta, and others, speak highly in favor of the internal and external use of vinegar as a preventive in this affection. A tablespoonful of strong vinegar is to be given three or four times daily for several weeks. Much has also been said in praise of the internal use of cantharides as a protection against rabies. This remedy is mentioned by Rhazes; and among the moderns, Werlhof,† Bucholz, and particularly Rust,‡ have spoken decidedly in its favor. Axter, a German surgeon of deserved celebrity, states, that he never knew the internal administration of cantharides to fail in preventing rabies. As principal surgeon of the general hospital at Vienna, he had frequent opportunities of treating cases of this kind, and his opinion, as Richter observes, is entitled to great weight, as it is founded on a long course of very extensive experience. He gives one grain of the powdered cantharides daily in union with tartar emetic, for five or six days in succession, and keeps the wound open for six weeks, by vesicatories and powdered cantharides.§

No remedy has had more repute as a preventive of hydrophobia, than *mercury*. Astruc, Sauvages, Van Swieten, De Haen, Tissot, Portal, and Werlhof, regard this article as the most certain prophylactic we possess against rabies. Many examples, illustrative of its good effects, have been reported; but the instances in which salivation has failed to prevent the occurrence of the disease, are, perhaps, no less numerous, and it is now generally regarded as entitled to but very little confidence in this respect.‖ Within the last few years M. Coster, a French surgeon, has published some statements which would seem to show that chlorine has the power of decomposing and destroying the hydrophobic virus. Two tablespoonfuls of chloruret of lime are to be dissolved in half a pint of water, with which the bitten part must be frequently bathed. It is said to have proved successful when applied six hours after the bite was received.

Cold bathing or *affusion* is recommended by Celsus and Cœlius Aurelianus, as a powerful prophylactic means in this affection. Cases of its successful application are mentioned by Van Swieten, Sabatier, Andry, and others; and it can scarcely be doubted, that by its invigorating and alterative effects, it is, at least, a very proper auxiliary to whatever other measures may be employed to obviate the disease.

Besides the remedies already mentioned, a vast number of nostrums and mixtures have had a temporary reputation as prophylactics against rabies. These, however, have all passed into merited neglect; and at present there is perhaps no article of this kind that is countenanced by any respectable member of the profession.

Most of the foregoing remedies have also been employed for the purpose of curing the disease after it has actually made its appearance. Stark asserts, that he cured two cases of hydrophobia by the exhibition of belladonna in large doses; and Sauter relates several remarkable instances which yielded to the powers of this remedy.¶ He gave it in doses of from eight to twelve grains of the pow-

* Besides the vegetable substances mentioned in the text, the following have been employed and especially recommended, for the prevention of rabies. *Rad. Cynosbati* (Van Swieten); *Celtis australis; phytolacca decandra* (Harles); *celtis ambralis* (Hufeland's Journal, bd. xxxii.); *valerian* (Bouteille); *nux vomica* (Thebesius, Leidenfrost); *faba St. Ignatii; datura stramonium* (Mease, Cooper, Harles, Brera, Hannemann); *tobacco* (Barton's Med. and Phys. Journ., vol. ii. p. 122); *lycopodium clavatum* (Hildebrand); *camphor* (Schmucker); gentiana pneumonanthe; hypericum dubium; thalictrum flavum; paris quadrifolia; cichorium intybus; genista tinctoria; ranunculus sceleratus; campanula patula, and glomerata; polypodium bistorta; mercurialis perennis, &c.

† Opera Omnia, part iii. p. 699.

‡ Ueber d. durch den biss ein. hundes veranlaste Wasserscheu—in dessen Magazin. f. d. gesammte heilkunde, 1816, b. i. p. 97.

§ Richter's Specielle Thérapie, b. viii. p. 278.

‖ The *carbonate of ammonia* (Martinet, Darluc); *musk* (Dalby, Nugent, Tissot, Gmelin); *acetate of copper* (Leib.); *copper filings* (Cothenius); *phosphorus* (Zinke); *arsenic* (Lond. Med. and Phys. Journ., 1789), have all been recommended for their prophylactic powers in this affection.

¶ Hufeland's Journal, bd. xi. p. 3.

dered root every forty-eight hours. Shallern also cured a case of completely developed rabies by the use of this narcotic.* A case is related in *Hufeland's Journal*, (b. xliv.) which was successfully treated by a combination of *anagalis*, *marum verum*, and *basilicum;* and the celebrated Vogel asserts, that he cured several well-marked cases with a decoction of the anagalis.† According to Martinet, the liquid caustic ammonia has arrested the disease in four instances. He gave sixty drops at first, and afterwards fifteen drops every two hours, with a few ounces of a strong decoction of cinchona every four hours.‡ Rust states that he succeeded in subduing the disease, in one instance, with large and repeated doses of *cantharides;*§ and Axter prevented the full development of the disease, after unequivocal symptoms of its attack had already made their appearance. The *meloe majalis* was used successfully by Kortum; and Selle employed them with decided benefit. The very free use of mercurial remedies—particularly in the form of frictions, in conjunction with baths and musk—is said to have been employed with success in some instances of rabies, (Callisen, Rougemont.) Dr. Munckly has related a case which yielded under the influence of a free mercurial salivation.‖ *Olive oil*, both externally and internally employed, is said to have removed this affection.

Both Celsus and Cœlius Aurelianus recommended frictions with warm oil as an efficient remedy in rabies. Vater has adduced facts illustrative of its curative powers in this affection,¶ and Shadwell, an English physician, has given an account of a case, which would appear to have yielded to the internal and external use of sweet oil.** The *cold plunging-bath*, or copious affusions, is mentioned by Van Swieten, as having succeeded in arresting the progress of rabies;†† and Morgagni refers to similar instances of success; although he himself saw an instance in which the patient died almost instantaneously on being plunged into cold water. Dr. Arnell has related a case in which pumping for two hours and a half on the patient, was decidedly beneficial.‡‡

Copious blood-letting also has been much insisted on as a remedy in hydrophobia, and there were not wanting well-authenticated instances of its beneficial effects. Pourpart asserts that prompt and very copious abstractions of blood, so as to induce complete syncope, have effectually arrested the disease;§§ and Dr. Hartley cured a case by taking away 120 ounces of blood in the course of a few days.‖‖ In one case, blood was drawn to the extent of producing syncope during each paroxysm of the rabies, with the happiest effect;¶¶ and Dr. Russell states that a vein was opened in a young woman affected with rabies, and suffered to bleed until she fell down in a state of syncope, with the effect of arresting the disease.*** Dr. Rush was a strenuous advocate for copious venesection in hydrophobia. We may also cite the cases reported by Burton, Grisley, Willoughby, and particularly the interesting instances related by Tymon,††† Schoolbreed,‡‡‡ Wynne,§§§ Goeden,¶¶¶ as striking examples of the occasional good effects of decisive bleeding in this affection. In Dr. Tymon's case, blood was at once drawn until the pulse could be scarcely felt, and 100 drops of laudanum

* Bernstein's Neu. Beitraeg, b. ii. See also Hecker's Annal d. gesammt. Med., bd. ii. p. 90—quoted by Richter.
† Prælectiones.
‡ Richter's Specielle Thérapie, bd. viii. p. 320.
§ Salzb. Med. Zeit., 1811, No. 76.
‖ Med. Transact, vol. xi. art. xii.
¶ Programma de Ol. Olivar. efficacia contra morsum canis rabida—as quoted by Richter.
** Mem. of the Med. Society of London, vol. iii.
†† Commentaries, vol. iii. p. 576.
‡‡ Med. Recorder, 1824.
§§ Histoire de l'Academie des Sciences, Paris, 1699.
‖‖ Philosophical Transactions, 1738.
*** Historical Magazine for 1792.
††† Ibid., Jan. 1813, p. 30.
‡‡‡ Hufeland's Journal, bd. xlii. p. 64.
¶¶ Gentleman's Magazine, Sept. 1752.
††† Edin. Med. and Surg. Journ., 1813, p. 22.
§§§ Med. and Phys. Journ., Nov. 1814.

administered, with injections of 300 drops of laudanum every two hours. On the following day two grains of opium with four grains of calomel were administered every two hours, and continued to the sixth day, when ptyalism, with gradual subsidence of the disease, occurred. In the case reported by Dr. Schoolbreed, about fifty ounces of blood were drawn from a large orifice at once. Syncope ensued, and the disease was for a time manifestly moderated. As the symptoms appeared to increase again, he was once more bled to fainting, which had the effect of completely subduing the *water dread*, and paroxysms of fury. Calomel and opium were given for some time, under the use of which the patient's health was re-established. Parry, nevertheless, considers these two cases as very equivocal instances of rabies; but the histories given of them leave us little or no room to doubt that they were genuine instances of hydrophobia. A number of cases have indeed been reported, in which the most energetic depletion did not produce the slightest impression on the disease. Dupuytren, Magendie, Breschet,* Bellingen, Horn, Marshal, Olbers, Hufeland, Rust, and others, state that they have not derived the least advantage from this measure.

In conclusion, it is proper to state that, among the prophylactic measures, a regulated regimen, gentle exercise, an attention to the regular action of the bowels, and particularly avoiding violent mental emotions, overheating, violent exercise, as well as the influence of sudden atmospheric vicissitudes, and all kinds of stimulating drinks, are all important observances.

CHAPTER II.

CHRONIC NERVOUS AFFECTIONS, IN WHICH INTELLECTUAL AND MORAL FACULTIES ARE DISORDERED.

SECT. I.—*Mental Derangement.*

WITHOUT stopping to inquire into the nature and laws of the human understanding, or into its mysterious connection with the animal body, it will be enough for our purpose to observe, that all the perceptions of the mind, and consequently all the materials upon which alone it can exert and manifest its powers, are derived from impressions communicated to it through the medium of the body. It is here assumed, therefore, that without a morbid condition of those parts of the organization which receive and convey to the mind the elements of thought, and which thus constitute, as it were, the connecting link between intellect and the external world, insanity can have no existence.

Pathologists have endeavored to ascertain the seat of the *primary irritation* of insanity; but the observations we have upon this point are as yet vague and unsatisfactory. Pinel maintains that the primary seat of mental derangement is located in the epigastric region, whence the morbid irritation is propagated to the common sensorium. This is an old doctrine. Aretæus† observes, "verum præcipuæ furoris et melancholiæ sedes viscera sunt;" and it is, indeed, extremely probable, that in some instances, at least, the primary source of insanity consists in an irritation seated within the abdomen. The intimate sympathetic relation that subsists between the brain and the chylopoietic viscera, is well known. A derangement in the functions of the one seldom fails to induce a corresponding disorder in the functions of the other. Sudden fear, or disappointment, or vio-

* Orfila, Toxicology, &c.

† De Caus. et Sign. Morb. Diut., lib. i. c. 37.

lent anger dissipates in a moment the keenest appetite; and a disordered state of the digestive organs is no less apt to give rise to torpor of intellect, irresolution, despondency, and waywardness of temper. In whatever part of the body the primary irritation may be located, it must, however, always be communicated to the *brain*, the mental organ, before the intellectual faculties can be deranged; and the proximate cause of insanity may, therefore, be regarded as consisting in morbid cerebral excitement, existing either as a sympathetic or primary affection. As the musician cannot draw melodious tones from an instrument that is defective, so the mind cannot produce harmonious and correct thought, when its organ, the brain, is in a state of morbid excitement; and it matters not whether this morbid condition be the result of causes acting immediately on the brain, or of such as primarily affect other organs, whose sympathetic relations are such as to throw the irritation upon the common sensorium.

What is the nature of the cerebral affection upon which the derangement of the intellectual faculties immediately depends? According to Dr. Rush, it consists in a morbid action on the blood-vessels of the brain; whilst others view it as simply a state of nervous or cerebral irritation, without any necessary connection with disordered vascular excitement. That the capillary blood-vessels of the brain are in a state of morbid excitement in perhaps all instances of mental derangement, is, I think, extremely probable. Whether, however, this irregular vascular action in the brain constitutes an essential condition of insanity, or whether it be only one of the consequences of the primary cerebral irritation, may admit of some doubt. No nervous irritation can be long maintained without inducing diseased action in the blood-vessels. However this may be, insanity, doubtless, always depends on disordered function of the brain; and the deranged cerebral function is probably invariably the result of morbid action of both the medullary structure and the blood-vessels of this organ.

Causes.—The *predisposition* to insanity is, in many instances, very evidently dependent on an *hereditary* peculiarity of organization. Dr. Rush mentions several very striking examples of this kind.* Esquirol asserts, that, according to his own observations, one-half of the cases of insanity which occur among the wealthy, and at least one-sixth of those among the poor, depend on hereditary predisposition;† and according to a tabular statement given by Dr. Casper,‡ it appears that in the different hospitals in Paris, the proportion of cases depending on hereditary predisposition, is to the whole number as about 1 to 4½. Esquirol states that he has met with an instance of seven sisters and brothers out of one family having been affected with insanity;§ and Haslam mentions ten families, in every one of which, several cases of mental derangement occurred.‖ Dr. Rush observes, that the following, among other peculiarities, attend this disease, where the predisposition to it is hereditary: "1, weaker exciting causes develop the disease than where the predisposition to it has been acquired; 2, it is apt to come on about the same period of life at which it appeared in the patient's ancestors; 3, children born *previous*, are less apt to become insane, than such as are born *after* the occurrence of mania in their parents; 4, in some instances of families in which madness has existed, the disease passes by the understanding in their posterity, and appears in great strength, and eccentricity of memory and of the passions, or in great perversion of their moral faculties."

The liability to mental derangement is greatest between the twentieth and fortieth years of age; and according to the observations of Esquirol, more particularly between the ages of twenty-five and thirty. The following tabular summary in relation to this point, drawn up by Dr. Casper from the observations of

* On the Diseases of the Mind, second edition, p. 48.
† Dict. des Sciences Medic., Art. Folie.
‡ Characteristic der Französischen Medicine, von J. L. Casper, p. 380.
§ Loc. citat.
‖ Observations on Madness and Melancholy, p. 231.

Pinel, Esquirol, Haslam, and others,* shows that from the thirtieth to the fortieth years of age, the occurrence of insanity is decidedly more common than during any other equal period of life. During childhood, or before the age of puberty, mania occurs very rarely. Instances are nevertheless mentioned, in which insanity appeared at a very early period of life. Dr. Rush saw two cases in children only two years old; in one instance it appeared during the seventh, and in another during the eleventh year of age. Haslam also relates an instance which occurred in a girl only four years old; in another instance the disease came on in the seventh, and in a third one about the tenth year of age.

Old age is almost equally unfavorable to the occurrence of mania. Dr. Rush states that he has met with but four instances in which the disease came on after the sixtieth year of age. It has, moreover, been observed that maniacs rarely live to a very protracted age. Dr. Casper, however, mentions a very remarkable exception to this general fact. A colored woman, he says, who had labored under mental derangement for upwards of eighty years, was brought into the Hospital Salpêtrière in a state of raving insanity, at the very advanced age of *one hundred and seventeen years*.†

In relation to the relative frequency of insanity in the two sexes, it is pretty generally admitted that it is more common in females than in males. Haslam gives a statement, from which it appears that, during a period of forty-six years, there were 4832 female, and only 4042 male lunatics admitted into the Bethlehem Hospital in London. It appears, however, from the inquiries of Dr. Casper, that the proportion of female over male lunatics is much greater in France than in England.

It is worthy of notice that the predisposition to mental derangement is very generally connected with black or dark brown hair, and a dark complexion. Esquirol states that out of two hundred and twenty-seven females affected with mania, one hundred and fifty-two had dark, thirty-nine fair, and thirty-six gray hair. Dr. Rush informs us that of nearly seventy patients in the Pennsylvania Hospital, who were examined with a reference to this fact, in the year 1810, "all except one had dark-colored hair." In some regions mental diseases are manifestly *endemic*. This is the case with the *Cretins* in many of the gorges of the mountainous districts of Europe: and it would appear that this disease is found only where the soil is *calcareous*.‡

The *exciting causes* of mental derangement are usually divided into the *moral* and *physical*—or into those which affect the animal organization through the medium of the mind, and those which act directly upon the body. Of the former kind are—intense mental application to one subject; violent rage; jealousy; excessive joy; sorrow; hatred; terror; surprise; fanaticism; unrestrained imagination; disappointed love, ambition, or vanity; mortified pride; chagrin; protracted mental depression, and religious enthusiasm. From the following table it would appear that grief, distress, want, and disappointed love are decidedly the most common exciting causes of insanity. Mr. Pinel observes that a frequent and powerful source of insanity is the struggle between the principles of religion,

	Age.						
	15 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80
Pinel, in the Bicêtre, from 1784–94 (males) admitted,	65	339	380	236	130	51	0
Esquirol, in Salpêtrière, from 1811–14 (females) admitted,	171	135	403	205	115	66	23
Haslam, Bethlehem Hospital, from 1784–94, admitted,	113	488	527	362	143	131	0
Esquirol's private institution, 1811–14 (wealthy patients),	0	150	78	30	46	15	8
Hospital of Retreat at York, 1796–1811 (Quakers),	8	44	28	28	27	9	4
	357	1156	1416	861	461	272	35

† Med.-Chir. Rev., Sept. 1820, p. 25. ‡ Ibid.

morality, and education, on the one hand, and the urgent influence of the natural propensities and the passions on the other.*

Among the causes that act directly on the body, the following are the principal; inanition from excessive hemorrhage or defect of food; intoxication; suppressed habitual discharges, particularly the catamenial; onanism; inordinate venereal indulgence; restrained or unsatisfied venereal passion; worms in the alimentary canal; blows or falls on the head; apoplexy; epilepsy; repercussion of chronic cutaneous eruptions; pregnancy; parturition; the puerperal state; syphilis; intense pain; very low and high atmospheric temperature; an inordinate or improper use of mercury; various narcotic poisons; atmospheric influences; gastro-intestinal irritation; the healing up of old ulcers; and the various forms of acute diseases.

From the table given above, it appears that verminous irritation is no uncommon cause of insanity. Dr. Casper informs us that Esquirol stated in his lectures, that he had known eleven persons cured of mania after the expulsion of a large number of lumbrici by the use of anthelmintics. Mania appears, indeed, often unequivocally connected with intestinal irritation. The observations of Dr. E. Percival and Dr. Prichard on what the latter terms *enteric* mania, may be consulted with much advantage. In these cases the morbid condition of the alimentary canal is generally decidedly marked. The gastric, biliary, and intestinal secretions are depraved; the bowels are loaded, tumid, flatulent, and much constipated; sharp and transient pains are felt in the abdomen; the tongue, fauces, and velum pendulum, become red, injected, and tender; the appetite is irregular, or there is much aversion to all kinds of food. The puerperal state,

PHYSICAL CAUSES.	Salpêtrière, in the years 1811–12.	Esquirol's private hos. 1811–12.	Bicêtre, 1803–13.
Hereditary,	105	150	
Pregnancy,	11	4	
Epilepsy,	11	2	118
Suppressed Menstruation,	55	19	
Puerperal State,	52	21	
Old Age,	60	4	36
Coup de soleil,	12	4	
Injuries of the Head,	14	4	
Congenital,			69
Fever,	13	12	157
Apoplexy,	60	10	
Malformation of the Skull,			9
Fire and other injurious Substances,			27
Syphilis,	8	1	
Imprudent use of Mercury,	14	18	
Onanism,			21
Intoxication,			106
Worms,	24	4	
Suppressed Cutaneous Diseases,			6
Suppressed Hæmorrhoids,			
MORAL CAUSES.			
Grief,	105	31	99
Unfortunate Love,	46	25	37
Fanaticism,	8	1	55
Fright,	38	8	
Jealousy,	18	14	
Anger,	16		
Distress and Want,	77	14	116
Mortified Pride,	2	16	
Disappointed Ambition,		12	78
Intense and Protracted Study,		13	49
Misanthropy,		3	
Vives Révolutions d'esprit,			58
Political Causes.(a)	14	31	

(a) Casper, loc. cit., p. 380.

too, is a frequent exciting cause of mental derangement. According to Haslam, eighty-four out of sixteen hundred and sixty-four maniacal patients admitted into Bethlehem Hospital, came on soon after parturition. The proportion of cases from this cause, in relation to the whole number of admissions into the hospitals in Paris, has been estimated at about one to thirteen. Esquirol observes, that moral influences are generally more concerned in the production of puerperal mania, than the physiological changes that are effected in the system by child-bearing.* The despair and heart-rending grief which seduction, loss of reputation, and abandonment, inflict upon some; the blighted hopes of success in life, and the consequent anticipations of poverty and want; the faithless and unkind conduct of the cherished father; these, and a number of other similar moral influences, frequently act, in co-operation with the debility, exhaustion, and general physiological condition present in the puerperal state, in the development of mental derangement. Out of ninety-two cases of puerperal mania admitted into the Hospital Salpêtrière during a period of four years, thirty-seven became affected with the disease between the first and fourteenth days after parturition; seventeen, between the fifteenth and sixteenth days; nineteen, between the sixty-first day and the eleventh month after confinement, and during lactation; and nineteen immediately after ceasing to suckle. (Casper.)

Atmospheric influences also have a manifest agency in the causation of insanity. It appears that summer and spring are decidedly most favorable to the occurrence of mental diseases. Casper asserts, that the admissions into Esquirol's private institution, during the six months from March to September, amounted to double the number that were admitted during the remainder of the year; and by the following statement of the admissions into the hospital Salpêtrière, for each month, during eight years, we perceive this fact sufficiently illustrated.† It appears, therefore, that high atmospheric heat is more favorable to the occurrence of mania than cold weather.

Prostitution, and its train of evils, syphilis, intoxication, and mercury, appear to be very common sources of insanity in populous cities—and according to Esquirol, particularly so in Paris. It is asserted, that a twentieth part of the insane females admitted into the Salpêtrière were previously prostitutes. It is stated by Casper, that mental derangement from intoxication is found, by the records of the Parisian hospitals, to bear a proportion to the whole number of admissions, as 1 to 23 with females; and 1 to 10 with males. In England, the proportion of lunatics from this cause appears to be greater. It has been estimated to amount to about one-fifth of all the cases that occur. Dr. Rush states, that at one time the number of maniacs in the Pennsylvania Hospital, in which the disease was excited by the excessive use of ardent spirits, amounted to one-third of the whole number!

Onanism, says Dr. Rush, is much more frequently the cause of insanity in young persons than is generally suspected.‡ According to the foregoing etiological table, it would appear that in Paris, insanity from this cause occurs in the proportion of one out of fifty-eight in women of the lower order of society; and one out of fifty-one in males of the same class. In the higher classes it occurs in both sexes in the ratio of about one to twenty-three.

Sudden suppression of the cutaneous transpiration often gives rise to mental derangement. Esquirol mentions the case of a man who was subject to copious sweating about the head. He became insane in consequence of having washed himself with cold water, with the view of restraining the profuse perspiration. "A young man waded across a rivulet while freely perspiring. He had a rigor on going to bed, and immediately afterwards became maniacal."

Mental derangement from repelled cutaneous affections, is by no means un-

* Journal de Médecine, par Sedillot, tom. 61.

† Admissions of lunatics in the Hospital Salpêtrière from 1806 to 1814. January, 162; February, 173; March, 187; April, 196; May, 243; June, 251; July, 265; August, 239; September, 206; October, 197; November, 198; and December, 191.

‡ "La masturbation, ce fleau de l'espèce humaine, est plus souvent, qu'on pense, cause de folie, surtout chez le riches." Esquirol, Dict. des Scien. Méd., Art. Folie.

common. Some very striking instances of this kind are related by Dr. Casper. He saw in one of the hospitals in Paris, a maniacal female of a plethoric habit, in whom the healing up of an old fistulous ulcer on the left arm excited the disease. A blister was laid upon the arm, which caused violent phlegmonous erysipelas over the whole extremity, and the re-opening of the ulcer. The patient was almost immediately relieved of her mental disease. In a short time, however, the ulcer cicatrized again, and the mania retured. He mentions another instance of mania, which came on immediately after healing an old ulcer on the leg. The ulcer was re-opened by local applications, and the mental affection disappeared. A young physician became affected with erysipelas: the inflammation subsided, and was substituted by mania. After a long time he suffered a second attack of erysipelas, and the mania disappeared.

Mania sometimes occurs in connection with consumption. There is, at this time, a young lady under my care, who has, for the last nine months, been in a state of complete insanity from this cause. About a year ago, phthisis pulmonalis developed itself in her system. Three months after unequivocal symptoms of the pulmonary affection had come on, she became taciturn, morose, and finally maniacal. The consumptive symptoms continue, but she does not appear to be conscious of any disease of this kind. She coughs much, expectorates but little, has irregular hectic exacerbations, and night sweats. Haslam, indeed, denies that such a complication has ever occurred; and maintains, that cases of this kind are to be regarded as co-existing or concomitant diseases, without any mutual dependence between them.* The occurrence of insanity, as a consequence of pulmonary phthisis, is, however, well established. Dr. Casper saw an instance of this kind in the Hospital Salpêtrière. When the cough and hectic symptoms were present, the patient was entirely free from derangement of mind; but in the absence of the phthisical symptoms, the patient was furiously insane.

Sudden reverse of fortune is one of the most frequent causes of melancholy. Out of four hundred and eighty-two melancholic patients admitted into the Hospital Salpêtrière in the course of four years, forty-eight cases arose from this cause. It is generally believed that the moon has a decided influence upon maniacal subjects—an opinion which, I am inclined to believe, is founded on correct observation. Esquirol, however, entertains a different opinion. He observes, indeed, that the insane are generally much more agitated and boisterous about the full moon; but the same thing, he says, occurs about the break of day every morning. He thinks that *light* is the cause of this increased excitement of the maniacal symptoms at both periods. Light, he says, agitates all lunatics.

Prognosis.—The degree of sanability of maniacal cases has of late years been an object of very particular inquiry; and the various reports that have been published on this head, show that the number of instances in which a cure is effected is by no means inconsiderable. From the following tabular statement,† drawn

* Loc. cit., second edition, p. 591.

† FRANCE.	Period.	Number treated.	Cured.	Died.	Remain	Discharg'd partially relieved.	Discharg'd	Decimal proportion of cured.
Hosp. Salpêtrière,								
Pinel,	1801–1805	1002	473	250	370			0.47 1-5
Esquirol,	1806	333	160	33	140			.48
the same,	1807	289	136	70	83			.47 1-18
Pinel,	1812–1814	891	413					.46 1-5
Hosp. Bicêtre—								
Chamseru,	1807	102	33					.32 1-3
Hosp. Charenton,								
Pinel,	1789–1800	97	33					.34
Foderé,	1803	499	161					.32 1-4
Royer—Collard,	1806	355	134	36	142		5	.36 2-3
Chamseru,	½ of 1807	214	91					.42 1-2
Esquirol's pri. Ins.,	1801–1813	335	173					.51 7-11
Dubuisson's,		300	177					.59
								0.44 9-11

up by Dr. Casper from official reports, it appears as a general result, that in France 0.44 $\frac{9}{11}$ of maniacal patients are cured; whilst in England the proportion is not so great, being only 0.37$\frac{3}{5}$ of the whole number.

In looking over the foregoing table we observe that the annual number of cures effected in the Hospital Charenton has been pretty uniform during a period of fourteen years. At Bethlehem, on the contrary, we perceive that the difference in the proportion of cures effected, in the forty-six years from 1748 to 1794, and the fifteen years from 1800 to 1815, is eleven per cent. in favor of the latter period—a strong evidence, says Dr. Casper, that in England the treatment of mental diseases has, within the last twenty-five years, received great improvements.

From the following summary of the cures effected by Esquirol in the Salpêtrière, we perceive that the chances of recovery decreased very rapidly after the second year; and that after the fourth year, not more than one out of about 225 were cured.

There were treated in the years

	1804	1805	1806	1807	1808	1809	1810	1811	1812	1813	
Total Number.	209	212	206	204	188	209	190	163	208	216	total.
Of which were cured during the											
1st year,	64	73	78	60	64	48	48	44	75	50	604
2d,	47	54	49	55	57	64	51	30	41	49	497
3d,	7	4	10	11	4	9	7	8	11		71
4th,	4	2	3	1	2	4	1	3			20
5th,	3	2	1		1	1	3				11
6th,	2	1	1	2		3					9
7th,			1		1						2
8th,	1										1
9th,	1										1
10th,											
11th,		1									1
	129	137	143	129	129	129	110	85	127	99	1217

Veitch, in his report in 1816, states, that of twenty-eight cases of recent in-

ENGLAND.								
Bethlehem, acc'rding to Haslam,	1748–1794	8874	2557					.28 7-9
Haslam (dif. ac't).	1784–1794	1664	574					.34 1-2
St. Luke's, Tuke,	1751–1819	12173	5091	1013	166		5903	.41 5-6
Hospital at York, Foderé,	1777–1807	1739	746	192	141	410	250	.42 7-8
Retreat at York, Tuke,	1796–1811	149	49	26	47	18	9	.32 4-5
H. at Manchester, Foderé,	1766–1805	1686	667	190	85	220	324	.39 1-2
Hosp. at Montrose. Act of Parl.,	1805–1815	154	34	36	54	25	5	.22 1-13
Hosp. at Nottingham, Burrows,	1812–1819	336	179	39	48		70	.53 1-4
Hospital at Exeter. Burrows,	1801–1819	626	355	53	45		173	.56 5-7
Hospital at Glasgow, Burrows,	1819	183	39	10	106		28	.21 1-3
H. at Manchester, Burrows,	1820	350	74	31	190	2	71	.21 1-7
Bethlehem, Act of Parliament,	1800–1815	4810	1839					.39 1-4
Sum for England,		32744	12204					0.37 2-5

sanity, admitted into his private institution, he cured eighteen, but of one hundred and twenty-five inveterate cases, he succeeded only in five instances. In the Retreat at York, England, out of sixty-six patients cured of insanity, twenty-seven were affected during the first year, thirteen in the second, three in the third, one in the fourth, five in the fifth, three in the seventh, two in the ninth, one in the thirteenth, and one in the fifteenth. (Casper.) Pinel observes that after three years' ineffectual treatment, the chance of cure in insanity will be about as one to thirty.

Unfortunately, *relapses* are very common in mental diseases. In the Hospital Salpêtrière, relapses, according to the observations of Esquirol, have occurred in the proportion of about one in ten.* This agrees pretty well with the facts stated by other writers on this point. Relapses are most apt to occur during the spring and summer months, and particularly at those seasons in which the disease had made its attack in the first instance. (Esquirol.) Dr. Hallaran observes, that when a violent fit of mania subsides rapidly, it is particularly apt to return. If the patient, soon after recovery from an attack of mania, becomes corpulent, there is not, in general, much probability of a relapse.†

According to the observations of Esquirol and Georget, the mortality is greatest during the autumn and winter. Of seven hundred and ninety insane females that died during ten years, (1804–14,) in the Hospital Salpêtrière, one hundred and seventy-five died in the months of March, April and May; one hundred and seventy-four in June, July and August; in September, October and November, the number of deaths amounted to two hundred and thirty-four, and in the three remaining winter months, to two hundred and seventy.

With regard to age, it appears from the same observations, that the greatest number of deaths take place between the ages of forty and fifty in males, and between thirty and forty in females.

Maniacal patients appear to be much less obnoxious to contagious and epidemic diseases than individuals who are of a sound mind. This fact has been particularly noticed by Rush, Dubuisson, Mead, Willis, Reil, and Cox.

Mania sometimes terminates spontaneously, in consequence, apparently, of some critical evacuation. Dubuisson saw it cured by the supervention of dysentery, Esquirol by epistaxis; Pinel and Hallaran through spontaneous salivation; and instances are mentioned of the subsidence of mental derangement soon after the occurrence of profuse discharges of urine or tears, and, according to Buffon, of the semen.

In general, the difficulty of curing monomania and melancholy is greater than of the other forms of mental derangement. Haslam observes, that when melancholy alternates with raving madness, the chance of a cure is extremely small; and when monomania or melancholy is converted into madness, almost every hope of a fortunate issue may be abandoned.

Casper states, that Esquirol, in his lectures, observes, that when maniacs are able to recollect recent occurrences, with an oblivion of events long passed, the prognosis is much better than when they have a recollection of remote occurrences, without being able to remember what has recently transpired about them. Mania, connected with paralysis or epilepsy, may be regarded as absolutely hopeless. In general, acute and furious mania is much more under the control of remedial management than low, torpid and fatuous insanity. Mental derangement from physical causes generally yields more readily and permanently than when it arises from moral causes. A recovery of the general health of the system, without a corresponding melioration of the mental disease, is said to be an unfavorable sign. Puerperal mania appears to be more frequently treated with success than any other form of mental derangement.

Post-mortem phenomena.—Notwithstanding the zeal and industry with which post-mortem examinations have been pursued in relation to mental dis-

* Casper, loc. cit., p. 405.

† Haslam, loc. cit., p. 79.

eases, we have as yet derived but very little information from such researches concerning the nature and seat of insanity. Esquirol assured Dr. Casper that he had dissected the brains of more than twelve hundred subjects who had died of mania, and that he did not in a single instance discover any morbid appearances which are not found also in subjects who had never suffered any mental diseases whatever. In almost every instance, however, he found the two hemispheres of the cranium of unequal size—and this, he says, is the most constant phenomenon, and perhaps the most worthy of attention.*

Haslam, Reil, Esquirol, and others, state that in the majority of cases the brain is found preternaturally soft. Esquirol found the brain very soft in twenty-nine instances out of forty-four subjects; in fifteen it was of a firm consistence. According to Georget, however, softening of the brain is much more frequent than would appear from Esquirol's statement. Ossification of the *dura mater* is, according to the observations of Esquirol, no uncommon occurrence in maniacal subjects. He observes, moreover, that he invariably found a very firm adhesion of the lining membrane of the lateral ventricles to the adjoining substance of the brain. In several instances, Georget found the cerebellum totally disorganized. (Casper.)

Among the abnormal circumstances discovered in the thorax and abdomen, Esquirol mentions one in relation to the *position of the transverse colon*, which is of a very remarkable character. This portion of the intestinal tube, he says, is sometimes found sunk down so low as to pass into the pelvis, and often placed in a perpendicular instead of a transverse position. The phenomenon occurs most commonly in persons who labor under melancholia. It must be observed, however, that Mr. Lawrence asserts, that, instead of having found this position of the colon in those who had labored under insanity, he has seen it only in such as had never been affected by any mental diseases whatever. We perceive, from these contradictory observations, how little reliance is, in general, to be placed on the sweeping inferences which are so frequently drawn from post-mortem appearances, in relation to the proximate cause and essential location of diseases.

The diseases of the mind may be divided into four classes: viz., *mania*, *monomania*, *dementia*, and *idiotism*.

I. *Mania.*

General mental derangement is characterized by a rapid succession of incoherent ideas, and violent excitement of the passions, expressed by great agitation, loud vociferation, singing, menaces, and fury.

Mania is generally preceded by a marked change in the habits, tastes, attachments, and passions of the patient. He is usually animated, his sensibilities are keen, his ideas rapid, his temper irritable, jealous, and wayward. He is eccentric in his conversation and conduct; often betrays an unusually vicious disposition; he sleeps but little; is harassed by frightful dreams; forms various and extravagant plans for the increase of his fortune, or the good of the public; enters into ruinous speculations, or squanders away his means in childish or extravagant amusements, or in the purchase of unnecessary or useless articles of furniture, clothing, &c. Costiveness, a craving appetite, vertigo, cephalalgia, a sense of throbbing and tension in the head, and a dull and wild expression of the eyes, are among the common premonitory symptoms of mania. When the disease is once completely developed, the expression of the countenance is wild, and often ferocious; the eyes are prominent, sparkling, and in constant motion; the patient sings, whistles, vociferates, halloos, walks to and fro with rapidity, "or stands still with his hands and eyes often raised towards the heavens;" he does not sleep for many nights, sometimes not for weeks; he often manifests

* Dic. des Sciences Méd., Art. Idiotism.

great muscular power; the skin is dry, cool, and occasionally covered with profuse perspiration; the sensorial organs are extremely excitable; the appetite is sometimes craving, at others wholly absent; the bowels constipated, and the urine small in quantity and high-colored. The pulse is variable—sometimes full and strong, at others small, irregular and tense, or slow and intermitting, and occasionally morbidly natural. (Rush.) Perhaps the most constant and remarkable among the physical phenomena of mania, are continued watchfulness, and a *very peculiar disagreeable odor*, which exhales from the patient's body and excretions, and impregnates his clothes and bedding. (Esquirol.)* Some patients are tortured with a constant severe internal heat; and the majority experience *pain* in the head, or in some part or organ in the abdomen or thorax.

In the violent grades of mania, the mind forms erroneous perceptions of the impressions of external objects on the senses, or the senses convey erroneous impressions to the mind. In this case the patient does not recognize the objects and persons around him; mistakes "friends for strangers, and common visitors for his relations;" loses the consciousness of his individuality, and "is ignorant of the place he occupies, of his rank and condition in society, and of the lapse of time." The imagination is sometimes so powerfully excited, that its representations prevail over those of the senses. The patient hears voices, holds conversations with persons who, he imagines, are present, and in some cases these *voices* pursue and harass him wherever he goes, by day and by night, in public and in private. (Esquirol.) Sometimes the empire of volition seems to be entirely suspended, and the patient is no longer master of his own determinations. An irresistible impulse leads him to injure himself, or to inflict injury on others, to tear the clothes from his body, run out naked into the streets, leap out of the windows, and to commit various other acts of fury. The sense of modesty and delicacy is generally wholly obliterated, and "people of the finest previous feelings will deliver themselves up to the most indecent or culpable actions, without the consciousness of impropriety."

Mania may be continued, intermittent, or remittent. A single paroxysm may continue from a few days to several months, before it terminates in a remission, intermission, or in death. Some patients experience paroxysms of maniacal excitement at regular intervals of a day, a week, or month—the intervals being passed in a state of quiet and inoffensive insanity.† Mania may also assume a chronic form, with little or no distinct exacerbations. This constitutes what Dr. Rush has called manalgia. It is usually characterized by "taciturnity, downcast looks, a total neglect of dress and person, long nails and beard, disheveled or matted hair, indifference to all surrounding objects, and insensibility to heat and cold."

II. *Monomania.*

Monomania consists in a state of *partial* insanity—the patient being insane upon some one subject only, with a full and regular use of his intellectual faculties "upon all or nearly all other subjects." This class of mental diseases comprehends many varieties, as nostalgia, fanaticism, hypochondriasis, melancholia, misanthropy, satyriasis, &c.

This is by far the most common form of mental derangement, and is always entirely free from delirium or paroxysmal raving. In that variety which is usually denominated *hypochondriasis*, the hallucination relates to the patient's own body, or to the circumstances which he conceives have an especial sinister

* This peculiar smell issuing from the bodies of maniacal patients, is also particularly noticed by Wagoner, Simes, and Reil.—*Reil, Fieberlehre*, b. iv. p. 348.

† These remissions, says Esquirol, sometimes offer very remarkable anomalies. A patient will, for instance, remain in a state of profound melancholy for three months; the three following months will be passed in a state of high maniacal excitement, and to this three months of complete fatuity will succeed.

influence upon his own system, fortune, or happiness. The suggestions of his morbid imagination are taken from realities. He believes himself afflicted with certain incurable and fatal diseases, "particularly with consumption, cancer, stone, and above all, with impotency and the venereal disease." He fancies that some poison has been maliciously introduced into his system;* or that he has a living animal, or some other very injurious substance in his stomach or bowels. Some patients believe themselves transformed into inferior animals, as dogs, cats, wolves,† oxen,‡ cocks,§ &c. Others imagine themselves converted into trees, plants, pots, clocks, candles, glass, butter, straw, wax, &c. The following lines by Pope, give a sufficient enumeration of these singular hallucinations:

> Unnumbered throngs on every side are seen,
> Of bodies changed by various forms of spleen.
> Here living tea-pots stand, one arm held out,
> One bent; the handle this and that the spout;
> A pipkin there, like Homer's tripod walks,
> Here sighs a jar, and there a goose-pie talks.
> Men prove with child, as powerful fancy works,
> And maids, turned bottles, cry aloud for corks.

Tissot mentions an instance, in which the patient believed himself to be a lump of butter, and would not suffer any fire near him, lest he should melt. An eminent painter imagined himself made of wax, and avoided all contact with hard substances. (Tulpius.) Zacutus Lusitanus mentions a person who believed that his posteriors were composed of glass, and would on no account sit on anything but the softest pillows. Some hypochondriacs have thought themselves dead; others imagined that their souls formerly resided in some inferior animal, or in some fellow creature; in short, almost every imaginable hallucination of this kind has been known to occur in this variety of mental disease.

In many instances of monomania, the hallucination is not of distressing or sombre character. Some patients, though perfectly sane upon every other subject, have an unalterable belief that they are destined to make some great discovery, as the perpetual motion, the philosopher's stone, the squaring of the circle, &c. Others imagine themselves the legal heirs of crowns, princely fortunes, and hereditary honors. Professor Titel, of Jena, continued to perform his professional duties for some time, although laboring under the fixed hallucination of believing himself to be Emperor of Rome.‖ I knew a person who, for more than twenty years, was firmly persuaded that he was the President of the United States; and yet this individual would converse and think rationally upon all the ordinary concerns of life. Some believe themselves invested with a special commission from Heaven to perform certain pious acts, or to commit some deed, often cruel and horrid, under the persuasion that it is the command of Providence, and necessary for the general welfare of the world.¶ Others fancy they converse with spirits,

* Some years ago there was a foreigner—a barber, in Lancaster—who continued to occupy himself regularly and cheerfully with his customers, and to converse rationally upon all subjects except his own fortune, and the universal conspiration among his neighbors to poison him. He cooked his own victuals, and regularly every morning went about a mile to the river Conestoga to supply himself with water, which he asserted could contain no poison, since the fish continued to live in it.

† Qui lycanthropia detinentur, noctu, domo egressi, lupos in cunctis imitatur, et donec dies illucessat, circa defunctorum monumenta plerumque vagantur.—*P. Ægineta. De re Med.*, lib. iii. cap. 16.

‡ This was the case with the daughter of the king of the Argives, whom Virgil mentions.—*Protides implerunt falsis mugibus agros.* Eclog. vi. The madness of Nebuchadnezzar appears also to have been of this kind.

§ Alter gallos cantare audiens, ut hi alarum ante cantum, sic ille brachiorum plausu latera quatiens, animantium sonum imitatus est.—*Galen. de locis affectis*, lib. iii. c. vi., as quoted in Reil's Fieberlehre.

‖ Reil, Fieberlehre, b. iv. p. 39.

¶ Pinel mentions a case of a monk who imagined that the Holy Virgin had commanded him to murder a person whom he considered an unbeliever.

angels, and messengers from heaven. Tasso, in the latter years of his life, obstinately maintained that a spirit regularly visited, and held conversations with him.* Was not the celebrated Swedenborg a monomaniac?† Some monomaniacs have believed themselves to be the Messiah. Dr. Rush informs us that he has seen two instances of this kind. "We see this form of mania," says Dr. Rush, "in the enthusiastic votaries of all pursuits and arts of men. The alchymists, the searchers after perpetual motion, the metaphysicians, the politicians, the knight-errants, and the travellers, have all in their turns furnished cases of this form of derangement."‡

III. *Dementia.*

This variety of mental disorder "consists not in false perception, like the worst grades of madness, but of an association of unrelated perceptions, or ideas, from the inability of the mind to perform the operations of judgment and reason. The judgments are generally excited by sensible objects, but ideas, collected together without order, frequently constitute a paroxysm of the disease. It is always accompanied with great volubility of speech, or with bodily gestures, performed with a kind of convulsive rapidity. We rarely meet with this disease in hospitals; but there is scarcely a city, a village, or a country place, that does not furnish one or more instances of it. Persons who are afflicted with it are good-tempered and quarrelsome, malicious and kind, generous and miserly, all in the course of the same day."§

Dementia is, therefore, directly opposed, in its phenomena and character, to monomania; for in this latter variety of insanity, the mind is fixed upon some particular subject, and upon which alone it hallucinates; whilst in dementia, there is no leading idea, and "the mind," as Dr. Rush expresses it, "may be considered as floating in a balloon, and at the mercy of every object and thought that acts upon it."

IV. *Idiotism.*

This variety consists in a defective development, or impairment, of all the intellectual faculties, amounting sometimes to a total absence of mind; and in some instances, even to a destitution of the instinct which leads to the gratification of the animal appetites. Idiotism is frequently congenital. It may, however, be produced by various causes, as apoplexy, epilepsy, chorea, blows on the head, onanism, &c. It is the most hopeless form of mental disease; and, when congenital, or produced by the spasmodic affections just mentioned, it may be regarded as absolutely irremediable.

Treatment of Mental Diseases.

In France, England, and the United States, there is, in general, but little medicine employed in the treatment of mental diseases. In the year 1819, the expenses incurred for medicines at the Glasgow Lunatic Asylum was but eighteen

* Poole's Life of Tasso, p. 48.

† Of this kind of hallucination was that of the man mentioned by Horace:—

——— Fuit haud ignobilis Agris
Qui se credebat miros audire tragœdos,
In vacuo, lætus sessor, plausorque theatro.
Cetera qui vitæ servaret munia recto
More, &c.

‡ Boileau says:—

Tous les hommes sont fous; et malgré tous leur soins,
Ne different entre eux, que du plus au du moins.—*Sat.* iv. p. 27.

§ Rush on the Diseases of the Mind, chap. ix.

pounds sterling, whilst the sum expended for food and beer amounted to £1225. At the Exeter Hospital £1162 was expended for food and only £33 for medicines and instruments during the year 1819; and in the institution at Nottingham, the necessaries of life cost £920, whilst the expense for medicine was only seven pounds during the same period.

Fifty years ago the amount of expenses for medicines for the same number of patients, during an equal period, would have been much greater, although the proportion of cures effected was then considerably smaller than at present. Even at the present day, much more medicine is employed, according to Dr. Casper, for the cure of insanity, in the German hospitals, than in those of England and France, although the success of the former appears to be considerably less than that obtained in the latter.* The truth is, *medicines*, properly so called, are by no means the most useful agents in the treatment of a majority of mental diseases. *Much more is in general to be effected by appropriate moral influences*—by kind and humane treatment, and comfortable seclusion. The physician who looks for particular success in the management of lunatics, must enter into their feelings—take an interest in their real or imagined pleasures and pains, soothe and admonish them in a tone of kindness and affection, and appear among them, not as a stern ruler, but as a sympathizing friend and protector. It is by a moral treatment of this kind, more than by the materia medica, that the most good may in *general* be done in the management of patients laboring under mental diseases. The cruel and coercive measures that were formerly so generally adopted in the treatment of insane persons, are as injurious as they are repugnant to the best feelings of the heart. Humanity and reason combine against the employment of such remedial measures; and the triumph of reason and good feeling over cruelty and error, is nowhere more delightfully illustrated than in the improvement that has of late years been effected in this respect. Instead of subduing the miserable maniac with implements of terror and torture, or keeping him in trembling subjection by threatening looks and menaces, or endeavoring to put reason right by drugs, chains, cells, and hand-cuffs, physicians now know that a kindlier mode of management will often call back the unsettled and wandering intellect, when a contrary course would only fix it the more firmly in its wild and distracted mood.

One of the first measures in the treatment of *mania* should be to remove the patient from his friends and home, and to place him in some quiet and secluded situation. Dr. Rush strongly insists upon the importance of separation and proper seclusion; and the most eminent of the English, German and French writers advise the adoption of this measure. "Confined to a regular life and discipline," says Esquirol, "the patient is naturally led to reflect on this change in his situation; while the necessity of living among and submitting to the control of strangers is to him a powerful stimulus to regain his lost freedom and reason." When thus confined, the medical attendant must, in the first place, endeavor to obtain the confidence and good will of the patient. Kindness, consolation, affability, and in some cases a moderate yielding to the hallucination, will in general soon acquire the patient's confidence. Having gained this point, he must "soothe the irritable, repress the insolent, cheer the desponding, calm the excited, check the forward, encourage the timid, resist the importunate and petulant, but carefully attend to all reasonable requests." (Knight.)

Let it be observed, however, that in recommending separation and confinement, it is not intended to object to regular exercise in the open air, and the enjoyment of the society of suitable persons during the patient's intervals of comparative calmness. Whenever the weather is favorable, and the patient's condition will admit of it, free air and ample exercise should be allowed. The mutual association of patients similarly affected, and particularly during conva-

* In Berlin, the proportion of cures effected has been estimated at about 0.28; at Vienna about 0.27—whereas in France it averages about 0.44.—*Casper*, loc. cit., p. 413.

lescence, has also a favorable tendency. "Nothing," says Georget, "contributes more to the recovery than the mutual association of convalescents;" and for this purpose it is particularly important that the institutions in which insane patients are placed should have extensive gardens, well furnished with trees and flower-beds, and instruments of bodily amusements, such as swings, &c.

Idleness in monomaniac patients should be discouraged. Various amusing exercises, "as playing at quoits, the chase, shooting, and even chess, checkers, cards, and push-pin, should be preferred to idleness." (Rush.) Indeed, in cases of a moderate grade of maniacal excitement, *traveling* will sometimes do much good. Esquirol states that he has always found the disease conspicuously moderated after a long journey, particularly if it has been attended with difficulties and privations, and performed through a strange country. It is on this account, perhaps, that foreigners are more apt to be cured in England than natives (Wills), and that strangers sent to Paris are more readily restored to reason than the inhabitants of that city.

I have stated above, that in order to obtain the patient's confidence, it may be proper, occasionally, to give way in some degree to his hallucinations. This, however, must be done with caution. In general it is improper to encourage, in any degree, the particular error or false ideas under which the patient labors: and this is more especially to be observed with monomaniac patients. On the other hand, however, peremptory and absolute contradiction is perhaps still more unfavorable than indulgence, for it seldom fails to excite the anger and contempt of the unfortunate sufferer against the person who thus vehemently opposes the current of his hallucinated notions. "In the furious state, insane patients," says Dr. Rush, "should never be contradicted, however absurd their opinions and assertions may be; nor should we deny their requests by our answers, when it is improper to grant them. In the second grade of the disease we should *divert* them from the subjects upon which they are deranged, and introduce, as it were accidentally, subjects of another and of an agreeable nature. When they are upon the recovery we may *oppose* their opinions and incoherent tales by reasoning, contradiction, and even ridicule."

Where the insanity turns upon some prominent idea or passion, much benefit may sometimes be obtained by dexterously exciting some counteracting emotion or sentiment. Esquirol states that a melancholic man, who was in a state of great despondency, had his intellectual energies restored by having been told that he had a lawsuit on hand. An insane soldier was informed that the campaign was about to open. He immediately requested permission to join the army: it was granted, and he arrived at his regiment perfectly sane. "The excitement of new turns of thought," says Georget, "the rousing of inert faculties, form a third principle of moral treatment. For instance, endeavor to convince a king that he is without power, with the hope of reflecting that he may have been in error. Take the patient to the situation whence the subject of his hallucination proceeds—as, for instance, fancied voices, enemies, &c.,—and assure him of their non-reality. Awaken the passions, by reproaching them with indifference to parents, &c.; relate to them their past conduct, by telling them of their designs, as suicide, destruction of children, hatred to husbands, &c.; and by this management cures may sometimes be effected. In some instances it will be proper to substitute a real for an imaginary grievance." If a melancholic is harassed by *ennui*, withdraw him from his usual sources of amusement, so as to inflict on him real privations. The real *ennui* which he will then suffer will often prove a powerful means of diverting his mind from its hallucinations. If a patient, says Esquirol, imagines himself abandoned by his friends, we may sometimes promote his recovery by depriving him of every testimony of their affection, and thus awakening him to a sense of his real loss. Dr. Rush relates some remarkable instances in which sudden terror, excited by actual danger, had the effect of curing insanity.

The attempt to laugh or *ridicule* hypochondriacs out of their erroneous con-

ceptions, is in general as injurious as it is cruel. Upon this point Dr. Reid makes the following sensible and humane observations. "No one was ever laughed or scolded out of hypochondriasis. It is scarcely likely that we should elevate a person's spirit by insulting his understanding. The malady of the nerves is, in general, of too obstinate a nature to yield to a sarcasm or a sneer. It would scarcely be more preposterous to think of dissipating a dropsy of the chest, than a distemper of the mind, by the force of ridicule or rebuke. The hypochondriac may feel, indeed, the edge of satire as keenly as he would that of a sword; but although its point should penetrate his bosom, it would not be likely to let out from it any portion of that noxious matter by which it is so painfully oppressed. By indirect and imperceptible means, the attention may, in many instances, be gently and insensibly enticed, but seldom can we safely attempt to *force* it from any habitual topic of painful contemplation."*

During the exacerbations or periods of excitement, it sometimes becomes necessary to employ coercive measures. The only means employed for this purpose in the hospitals of this country, and I believe also in those of Paris, are the *strait jacket* and Rush's *tranquilizer*. Haslam condemns the former mode of restraining patients, in strong terms. It is certainly an offensive and oppressive mode of coercion in a state of furious mania. Haslam employs instead of it, a belt from eight to ten inches wide. This is passed round the lower part of the body, above the arch of the pubis, and fastened on the back by strong buckles. On each side, leather bags are fastened. Into these the hands of the patient are thrust, and secured there by proper bandages. By this contrivance the respiration is not impeded, as is always the case, to a greater or less degree, with the *strait waistcoat;* nor is the perspiration suffered to become offensive and injurious by being absorbed and retained in the waistcoat. Patients, too, may walk about with this belt without much inconvenience, and they are said to endure it with much more patience than the *jacket*. In Dubuisson's private institution, an arm-chair, resembling Dr. Rush's *tranquilizer*, is used as a mode of coercion. It consists of an arm-chair with a high back, and foot-board. The arms, legs, feet and body are fastened to this chair by strong and broad straps furnished with buckles.

A simple and very excellent means for moderating the violence of a paroxysm of mania, is the *total exclusion of light* from the patient. This is daily practised in the Salpêtrière. When a maniac begins to rave violently, a piece of thick cloth is quickly thrown over his head, and fastened over the eyes. This, it is said, generally immediately moderates the patient's fury, and he may then easily be conducted into his apartment and properly secured. Esquirol particularly lays great stress on the soothing influence of darkness on maniacs; and Dr. Rush enjoins it as a measure of much importance during the first stage of the disease. Confinement, darkness, solitude, low diet and cold affusions, will rarely fail to subdue the most turbulent and furious maniacs.

Medicinal Treatment.—Blood-letting was formerly much more commonly resorted to in maniacal diseases than is now done. Dr. Rush was a strenuous advocate for the employment of this evacuation in general mental derangement; and the old established *traitement de l'Hotel Dieu*, says Pinel, consisted almost entirely of repeated blood-lettings. In the Parisian and English institutions, we are told that venesection is now but rarely employed in mental diseases. There can be no doubt, however, that the abstraction of blood will often contribute considerably to the reduction and removal of acute mania; and we may safely and advantageously resort to this measure in all instances in which the pulse is full and active, or tense, corded, and quick, in connection with "great wakefulness, redness of the eyes, a ferocious countenance, and a noisy and refractory behavior." When the disease assumes the grade of phrenitis, with raving delirium, a hard and bounding pulse, throbbing of the carotids, flushed face, red eyes,

* Essays on Hypochondriacal and other Nervous Affections. By John Reid, M. D.

prompt and free venesection cannot with propriety be dispensed with. Georget* says, that in cases that occur about the pubertal period, accompanied, as they usually are, with general plethora, repeated small bleedings are particularly useful; and the same observation applies to cases that occur at the turn of life in females. When mental derangement is attended with suppression of an habitual sanguineous evacuation, cupping or leeching near the parts from which such discharges occurred, will sometimes contribute considerably to the removal of the mental malady.† In monomania, or generally in all those varieties of mental alienation that are unattended with paroxysms of high cerebral excitement, bleeding can do no good, and may prove permanently injurious.

Purgatives are often very useful auxiliaries in the remedial management of lunatics. Where there is reason to believe that the bowels are in a loaded condition, or irritated by vitiated secretions, that is, where the tongue is furred, with pain on pressure in the region of the liver, a hard abdomen, and constipation, active purgation is particularly proper. Dr. Prichard observes, that in cases of this kind, (*enteric mania,*) the rectified oil of turpentine, in union with castor oil, is decidedly the most valuable purgative. Esquirol prefers mercurial purgatives, with the view of exciting the biliary secretion; and in instances where tension and tenderness exist in the right hypochondrium, there can be little doubt of their superiority. "There are cases," says Dr. Rush, "in which purges should be given daily, so as to excite an artificial diarrhœa," and calomel and jalap should be preferred for this purpose. When there is reason to suspect the existence of verminous irritation, anthelmintics should be given, in conjunction or alternation with active purgatives. Infusion of the root of spigelia, followed by a full dose of turpentine and castor oil, generally answers this purpose better than any other articles of this kind.

Emetics may occasionally be employed with manifest advantage, in the milder forms of mental derangement—more especially in melancholia, and in recent cases of hypochondriasis. They are improper, however, where there is much cerebral irritation, or in cases attended with much febrile excitement. Esquirol has found emetics useful in puerperal mania.

Mercury is much recommended by some writers, whilst others condemn its use in maniacal affections. With Dr. Rush, it was a favorite remedy in mania. "Too much," he observes, "cannot be said in favor of salivation in general madness;" and he strongly recommneds it also in partial insanity. As an alterative, it may be used, occasionally, with very considerable advantage in chronic mania, particularly where the disease is attended with prominent functional disorder of the biliary organs. Dr. Knight states that he has found the blue pill a valuable medicine in cases of long standing, and that he never knew it to be productive of any injurious effects; but he apprehends, that in recent cases of mania, the *constitutional* influence of mercury must be prejudicial in any form.‡

Narcotics and antispasmodics were formerly much employed in the various forms of mental derangement, and although by no means generally applicable, they may in some cases be used with advantage, after the general indications have been adequately attended to. Opium, when given in small doses, says Dr. Rush, may be useful, but it should never be given in large doses, with a view of procuring sleep in general mania. Regimen, exercise, purgatives, and the use of the warm bath, will commonly do more towards procuring sleep than any other remedies that can be employed. Indeed, opium never fails to increase the wakefulness, and when given in strong doses, before the general and cerebral excitements have subsided, it rarely fails to aggravate the disease. In chronic mania from masturbation, camphor has been recommended; but almost all recent writers agree,

* De la Folie, p. 293.

† D. Ratier, Formulaire Pratique des Hôpitaux Civiles de Paris, &c. &c.

‡ Observations on the Causes, Symptoms, and Treatment of Derangement of the Mind, &c. By Paul Knight, M. D.

that it very rarely produces any good effects, but on the contrary often manifest injury. In *puerperal mania*, however, Dr. Grooch asserts that camphor, given in union with the extract of hyoscyamus, (ten grains of each,) is the most useful anodyne we possess.* Dr. Knight also has found this combination very useful as a soporific in mania unattended with sanguineous congestion in the brain, or a general phlogistic habit.†

In maniacal affections succeeding the sudden suppression of the catamenia from cold, or any powerful mental emotion, advantage may be expected, says Dr. Prichard, from stimulating emmenagogues, in conjunction with efficient abstractions of blood, and warm semicupia. He considers the tincture of melampodium and the oil of turpentine, as decidedly the best emmenagogues in cases of this kind. Georget also recommends the use of emmenagogues, in conjunction with mustard pediluvia, hip-baths, and leeches to the pudenda, in cases attended with suppressed menstruation and cephalalgia.

The *warm bath* is a cardinal remedy in the treatment of insanity in the Parisian hospitals. In the *Salpêtrière*, the women use the warm bath two or three times a week, unless an apoplectic tendency, or some other circumstance contraindicating its use, be present. They remain in the bath from a half to two hours. (Casper.) Patients of a thin, nervous and irritable habit of body, says Esquirol, may be kept in the warm bath a very considerable time with advantage. When the vessels of the head are strongly congested, and much cerebral irritation is present, cloths saturated with *cold* water should be applied to the head, while the patient is in the bath. The heat of the water should be about 99° or 100° of Fahrenheit.

The *cold bath*, also, has been much employed in maniacal affections. In young, robust, and sanguineous patients, particularly when the skin is dry and preternaturally warm, considerable benefit will occasionally accrue from cold affusions. More advantage, however, may, in general, be obtained from the application of cold water or ice to the head, in young and excited maniacs with much sanguineous determination to the brain. In the early stages of mania, where there is much headache, redness of the face and eyes, and turgidity of the vessels of the head, *cold affusions* "from a cock, funnel, or pitcher," upon the top of the head, after leeching or cupping, with stimulating pediluvia and laxative enemata, often produce the most excellent effects.‡ "The signal for removing the cold applications," says Dr. Rush, "should be, when they produce chilliness, and sobbing or weeping in the patient." Dubuisson, in conformity with the recommendation of Hill and Cox, has applied ether to the head with much advantage.§

Counter-irritating applications may occasionally be employed with benefit in insanity. Esquirol was formerly much in the habit of applying moxas to the back part of the head, in cases attended with much torpor, but he has for some years past, in a great measure, discontinued this practice. "They augment," he says, "the erethism, torment the patient, increase his irritability, and convince the insane that he is a victim to our cruelty."‖ Georget, however, speaks strongly in favor of setons, moxa and blisters to the neck, in monomania, and other varieties of mental derangement accompanied with stupor, insensibility and cerebral inactivity. These, he says, in conjunction with the repeated exhibition of vomits, rouse the energies of the nervous system, in the most desperate cases of *aliénées stupides*. Dr. Rush, also, speaks decidedly in favor of the use of blisters. "They have," he says, "been considered as remedies of doubtful efficacy; but it is only because they have not been employed in the manner, or at the precise time that was necessary to obtain benefit from them. In the first stage of tonic or violent madness, the disease is intrenched, as it were, in the brain. It must

* Observations on Puerperal Insanity. Transact. of Lond. College of Phys., 1820, vol. vi.
† Loc. cit.
‡ Esquirol, loc. cit.
§ Des Vesanies on Maladies Mentales, p. 225.
‖ Loc. citat.

be loosened, or weakened, by depleting remedies, before it can be dislodged, or translated to another part of the body. When this is effected, *blisters* easily attract it to the lower limbs, and thus often convey it at once out of the body.

The *circular swing* has been much used in the institution for lunatics at Glasgow, and "in some cases, with wonderful good effects." Dr. Knight also asserts that this agent possesses "immense power" in subduing general and cerebral excitement. "A patient subjected to its action, is speedily affected with giddiness and sickness, and the peristaltic motion of the whole alimentary canal seems to be excited, and in some instances to such a degree that the patient vomits, and passes feces in rapid succession and great abundance, along with his urine. Apprehensions have been expressed, lest the use of the circular swing should induce apoplexy; having attentively examined the sources of these fears, I conclude them to be groundless; nor have I ever seen the slightest reason to apprehend such result; nor do I believe it can occur, *if the patient be not in a furious state when put into the swing*." The best time, says Dr. Knight, for using the swing "is a little before retiring to rest at night, as the unloading of the alimentary canal, the lowering, and the relaxation of the skin, very generally predispose to sound and refreshing sleep.*

Music sometimes has a most soothing influence over the distracted and raving minds of maniacal patients. Dr. Rush observes, that "lively tunes are as offensive as comic representations in this disease." Tissot relates an instance of insanity which was permanently removed by music;† and we read that Saul's melancholy was dissipated by the harp of David—*Tange lyram digitis, animi dolor omnis abibit, dulcisonum reficit tristia corda melos.*

Sect. II.—*Delirium Tremens—Mania à Potu.*

This very remarkable variety of mental disease is characterized by general inquietude, tremor, continued watchfulness, cool skin, perspiration, delirious loquacity, and sensorial illusions.

It occurs only in *habitual* drunkards, and in such as are addicted to the inordinate use of opium, and, perhaps, other narcotic stimulants. So long as the customary quantity of the stimulus is taken, the disease seldom, if ever, supervenes; but if from necessity, sickness, or a temporary disgust, the ordinary stimulating potations are suddenly left off, or greatly diminished, the activity of the brain becomes morbidly increased, and mental disorder, in many instances, speedily ensues. "It is important to bear in mind," says Dr. Coates, "that this disease is the result, not of the *application*, but of the *sudden intermission* of the use of these articles."‡

The disease usually commences with lassitude, general indisposition, a feeling of distress in the epigastrium, anorexia, nausea and vomiting, giddiness, a sense of confusion in the head, want of sleep, an anxious expression of the countenance, and tremor of the hands. After a day or two, the countenance exhibits an expression of alarm and suspicion, the eyes are cast about with quick and scrutinizing glances, or often fixed, apparently upon some object that attracts the attention for a moment, and then quickly withdrawn; the tremor of the hands increases; the patient becomes irritable, and sometimes irascible; he is extremely restless, walks continually to and fro, and is wholly unable to obtain a moment's sleep. He now begins to manifest mental disorder, becomes loquacious, says he feels well, and is tormented with a more or less continued succession of various alarming, disgusting, and ludicrous *apparitions*. He fancies that he sees dogs, snakes, cats, mice, and other animals in his room, and disgusting vermin crawl-

* Loc. cit., p. 63. † Reil's Fieberlehre.

‡ See an able and highly interesting memoir on this disease, by Dr. Coates, of this city, published in the North American Med. and Surg. Journ., vol. vii. p. 34.

ing over the bed, and on his clothes, or that various persons have entered his room, for the purpose of robbing, killing, or annoying him. To avoid these and other horrid illusions, he often calls out loudly for assistance; runs to the door to make his escape, or to the window to leap out; is greatly agitated, vociferates, threatens, and sometimes raves violently. Sometimes he fancies that he hears loud and strange noises around him, over head, in an adjoining apartment, or loud and frequent knocking at the door. His mind and body are in a continued state of action; he calculates, projects, walks hurriedly about the room, picks up money, runs up to the window, and calls out to some imaginary person in the street, starts with terror and agitation from the presence of frightful and disgusting apparitions, insists that he is well, and confined with some sinister intentions against him, and requests to be suffered to go out in pursuit of his usual occupations. If the patient is flatly contradicted, he usually becomes much exasperated, and insists with vehemence on the correctness of his notions; but, when he is soothingly dealt with, he will now and then answer certain questions mildly and even distinctly, and by judicious management, may, in general, be restrained without any violent coercive measures. When the disease rises to a high grade, the patient becomes violently and often furiously delirious, talks incessantly, is restrained with difficulty, and is unable to recognize his friends and acquaintances.

Patients affected with this disease do not appear to be susceptible of much bodily pain. "They never seem to experience any sufferings from fractures, though they may be at the time subjecting these to the most constant friction and concussion; and when the delirium supervenes upon a pleurisy, or other inflammatory affection, accompanied with pain, the principal disease seems to disappear, even to the eye of the experienced practitioner, to be reproduced at a later period, when the brain and nerves regain their ordinary tranquillity." (Coates.)

The pulse in this disease varies considerably in different cases. In some instances it is hard, full, and frequent, but much more commonly soft, full and quick, without strength or tension. The skin generally retains its natural temperature and moisture; the tongue is humid, and covered with a white fur; the bowels are torpid, and there is usually an entire loathing of food throughout the whole course of the disease, but the thirst for cold drinks is almost always considerable.

The duration and degree of violence of *delirium tremens* vary much in different cases. Sometimes slight tremor of the hands, with occasional transient manifestations of delirium, sensorial illusions, and watchfulness, continue for a day or two, and then pass off. At others, the wakefulness, tremor of the hands, and general restlessness and agitation, continue for five or six days, with delirium and annoying apparitions at night, whilst during the day but little mental hallucination is noticed. In some cases, the symptoms described above continue, with but slight remissions, day and night for one or two weeks and upwards, and in highly aggravated instances, the disease assumes the character of a wild and ungovernable mania. Dr. Armstrong observes that when convalescence is not restored within the first month, there will be a risk of long-continued, if not permanent alienation of mind.

Mild cases of this disease, when left to themselves, have been known to terminate spontaneously (Stoughton), on the supervention of diarrhœa or vomiting. The occurrence of profuse discharges of this kind, however, often brings on a low and typhoid condition of the system; and this is especially apt to be the case in persons who have been long and exceedingly intemperate, and in whom the disease is accompanied by some local inflammatory affection or general fever. In full and robust habits, the disease not unfrequently terminates in fatal convulsions or apoplexy.

Pathology.—It appears to be generally admitted that this disease has its primary and essential location in the sensorium commune, and that it is wholly independent of inflammation or vascular turgescence in this organ. It would seem to

consist in a purely dynamic disorder—a morbid activity of the brain, from the sudden abstraction of an habitual stimulus by which its excitability had been long repressed or blunted. Dr. Coates considers it as consisting in a "heightened activity of the sensorium," from the generation, as it would seem, of an inordinate degree of vital activity in the brain;* and similar views of the nature of this affection have been expressed by Dr. James Johnson, Dr. Ayre, and many other eminent British physicians.† Dr. Joseph Klapp, of this city, has published a series of cases, with observations, tending to show that the proximate or essential irritation of this disease is seated in the stomach, and it must be confessed that the arguments adduced in support of this opinion possess considerable plausibility.‡ It is asserted, in support of this opinion, that dissection almost uniformly discloses traces of previous inflammation in the stomach; that, in nearly all instances, nausea, vomiting and a foul tongue occur; and that the operation of an emetic, in many cases, brings off from the stomach a viscid, light-brown, or black-colored fluid, of the consistence of boiled tar; and, finally, that the disease yields more frequently and speedily under the employment of emetics, than under any other mode of remedial management that has hitherto been recommended.

In reply to these arguments it may be observed, that post-mortem signs of inflammation cannot be received as a valid proof that the inflammation was primary and causative, in relation to the peculiar train of phenomena which characterize the disease; for nothing appears to be more satisfactorily established than that mucous inflammation of the alimentary canal very often supervenes during the latter period of all violent diseases; and that the ordinary signs of inflammation—increased vascularity and sanguineous engorgement—are frequently produced in the last moments of life, or in *articulo mortis*. If the disease depended on mucous inflammation of the stomach, can it be conceived that emetics should in any instance operate beneficially? Would any prudent physician prescribe an emetic in a case attended with unequivocal gastritis? Dr. Klapp, indeed, does not appear to consider the morbid condition of the stomach as a state of inflammation; although Dr. Stoughton, who advocates the gastric pathology of this affection, lays particular stress on the post-mortem signs of phlogosis in the stomach, as an evidence of the correctness of this pathology. Dr. Klapp seems to consider the gastric affection as rather the reverse of inflammation—as a state of torpor, insensibility, and chronic irritation, or morbid excitement of the stomach. The argument drawn in favor of this opinion from the occasional good effects of emetics in this malady, affords it but little support. The *post hoc, ergo propter hoc*, is always a fallacious mode of reasoning. We may admit, to the full extent, the beneficial influence of emesis, and yet consistently deny our assent to the doctrine which alleges that the stomach is the primary seat of the disease. With regard to the foul tongue, vomiting, &c., mentioned in confirmation of this view of the nature of the disease, it may be observed, that the majority of writers do not bear testimony to the frequent occurrence of these phenomena. Dr. Coates found them "generally absent in the cases that came under his own inspection." Dr. Sutton mentions them only as symptoms accompanying the disease, where it occurred in connection with typhus fever, scarlatina, or some other acute affection; and Dr. Brown, of New York, has noticed a foul tongue only in two out of eight cases. Within the last six years, I have seen about ten cases of this disease, and although I have paid particular attention to all the phenomena that might throw light on its pathology, I do not remember of having noticed a foul tongue in more than three instances, one of which was complicated with pneumonia, and another with dysenteric symptoms.

Prognosis.—Delirium tremens is not, in general, a very dangerous affection, when it occurs in a simple and uncomplicated form, and in systems not yet greatly broken down and depraved by a long course of excessive intemperance.

* Loc. cit., p. 225.

† Med.-Chir. Rev., Feb. 1828, p. 484.

‡ Eclectic Repertory, vol. vii. p. 259.

When it supervenes during the course of violent forms of fever, and more especially during the existence of acute visceral inflammation, it almost invariably terminates fatally. The disease is also attended with peculiar danger when it occurs in confirmed drunkards, who have previously labored under chronic hepatitis, or some similar organic affection. Subjects of this kind generally rapidly sink under the disease. (Armstrong.) When the delirium becomes constant, the pulse rapid and very small, the extremities cold and covered with perspiration, the pupils small and contracted, with subsultus tendinum, and an agitated motion of the muscles of the face, death may be regarded as inevitable. It is also a particularly unfavorable sign, when coma, with sonorous respiration or convulsions, ensues. The occurrence of tranquil sleep, even of short duration, announces a favorable tendency in the disease; and no symptoms can be regarded as indicative of declension of the malady, so long as the patient is unable to obtain some sleep.

Treatment.—If delirium tremens depends—as I am well persuaded it does—on a morbid activity of the sensorium, independent of inflammation or sanguineous congestion, the prominent indication is obviously to subdue this inordinate cerebral activity; and it remains only to inquire, by what remedies or course of treatment this object is best accomplished.

If we attend to the circumstance that this peculiar condition of the brain is almost invariably the consequence, not of the application, but of the *sudden abstraction* of the customary stimulus, we are led, *à priori*, to infer, that the best mode of removing it is to supply a stimulus, which may be capable at once of blunting and exhausting the morbid excitability of the sensorium. For this purpose *opium* is decidedly the most valuable remedy we possess. Dr. Coates observes, and correctly too, that sleep must be produced *coute qui coute*—that the patient must *sleep* or *die*. Dr. Coates, however, goes too far, I think, when he expresses his conviction, that *every* case of simple delirium tremens may be cured by the "opiate treatment." Satisfied as I am that opium is the *remedium magnum*—the "sheet anchor" of our hopes, in this affection—there nevertheless exists no doubt in my mind, that important advantages may also be derived, in some instances, from other remedies, auxiliary to this potent narcotic. When the bowels are constipated, and there is reason to presume that they are in a loaded state, a purgative should be administered before recourse is had to the opium. This, like all other affections, may come on while the intestinal canal is charged with vitiated secretions and other irritating substances; and when it is considered that intestinal irritation from sources of this kind, has a powerful tendency to originate and support morbid excitement in the brain, the propriety of administering one or two active purgatives preparatory and auxiliary to the employment of opium in this disease would appear to be very obvious. It has appeared to me, indeed, that without this precaution, the free use of opium has a tendency, in some instances, to cause dangerous determinations to the head, and to bring on *coma* instead of healthy sleep. About four years ago, I was called to a gentleman, a few miles from the city, laboring under the ordinary symptoms of this disease. I found him sitting on his bed, busily engaged in driving away eels and snakes, which, he said, were annoying him; and he requested me to turn out of the room several negro children, who had placed themselves, he thought, on the tops of the bed-posts. This was the second day of his illness; his pulse was moderately full and compressible, and his tongue covered with a white fur. I at once directed two grains of opium to be given to him every hour, and to be continued until sleep should ensue. In the evening I visited him again. I found him lying on his back, apparently perfectly unconscious, his hands and arms, and muscles of the face in continual motion, uninterruptedly muttering indistinct words; the pupils contracted, and the whole frame in a state of tremulous agitation. The skin was moderately warm and moist, and the pulse frequent, small, and more firm than on the preceding day. With much difficulty I got him to swallow about an ounce of castor oil, with three drachms of oil of

turpentine, and directed a laxative enema to be administered in two hours afterwards. Early next morning I saw him again, and found him much relieved. The purgative had acted four or five times, and brought away large and very offensive stools. He immediately recognized me when I entered the room; his pulse was frequent and feeble, and he was still much harassed by various disgusting and alarming *apparitions*. I now directed him a grain of opium every hour; after the eighth dose was taken, he fell into a tranquil sleep, which lasted several hours. He recovered under the use of this narcotic, without any other remedy. I cannot, indeed, assert with certainty that the comatose state mentioned above was the result of the influence of the opium; but I am led to ascribe it to this cause, from having, in another instance, witnessed similar phenomena, after the use of large doses of this narcotic. Dr. Coates says: "I have never seen, read of, or heard of an instance in which opium was productive of harm." I must, indeed, be greatly mistaken in the diagnosis, if I have not seen one unequivocal instance of this kind. In a case which I regarded as pure and uncomplicated delirium tremens, four grain doses of opium were given every two hours. In twelve hours the patient was comatose, became convulsed, and soon expired. I mention these facts, not to deter from the use of this valuable, and, I may say, indispensable remedy in this affection, but as a caution to the practitioner to watch with assiduity its administration; "because we know not whether poisonous effects will be produced by an arithmetical or a geometrical increase—whether five grains, or thirty grains in addition, are sufficient to endanger the patient's life."*

The quantity of opium which it is usually necessary to administer before the desired soporific effect is produced, is often truly enormous. In some instances, from twenty to thirty grains, in divided but frequent doses, are required, before the full advantage can be obtained, which it is capable of affording. My usual practice has been to exhibit two grains every hour (after free purgation) until sleep is induced.

With regard to the employment of *blood-letting* in this affection, the opinion of the profession seems to be pretty well settled as to its general impropriety and inefficiency. Dr. Sutton informs us, that where blood-letting "has been principally relied on, he has observed a fatal termination of the disease in almost every case."† Dr. Armstrong, who is not inclined to undervalue this measure, asserts, that he is "fully persuaded that there are not many instances where the lancet is requisite;" yet "in constitutions that have not been shaken by reiterated drunkenness, he has known early and *moderate* venesection of much use." The experience of Dr. Brown, of New York, coincides with the observations of Dr. Armstrong on this point. Dr. Stewart "had seen the disease on a large scale. Almost all those patients who were treated on the antiphlogistic plan died, while those who were treated by opium and stimulants recovered."‡ The experience of Dr. Gregory, Dr. Shiel, Mr. Lambert, Mr. Mackelan, Mr. Chinnock, and Dr. Ayre, is decidedly against the use of blood-letting, and in favor of the stimulating and narcotic treatment, in uncomplicated cases of the disease.§ My own experience is entirely opposed to the employment of the lancet, under the ordinary circumstances of this malady. In very plethoric and robust subjects, it will, nevertheless, be proper to draw some blood, with the view of lessening the liability to dangerous sanguineous congestion in the brain; and thus enabling us to proceed with more confidence in the employment of opium.

Cupping about the head may, under certain circumstances, prove very useful. Where the sanguineous determination to the brain is considerable, and the raving becomes constant and violent, cups may be applied to the temples, forehead, and neck, with much advantage. Dr. Coates informs us, that in the Pennsylvania Hospital, Dr. Parrish has resorted to cupping in delirium tremens, with great

* Coates, loc. cit., p. 214.
† Tracts on Delirium Tremens, &c., p. 66.
‡ Med.-Chir. Rev., February 1828, p. 484.
§ Ibid., p. 485.

benefit. In an instance I attended about six months ago, where there was much vascular turgescence of the head, and a state of delirium approaching the raving of *phrenitis*, immediate and very decided benefit was derived from cupping. *Blisters* also will sometimes act beneficially when applied to the legs, or to the back of the neck, in cases attended with violent cerebral excitement. In one case, in which the disease seemed to verge into phrenitis, a large blister, laid between the shoulders, mitigated the symptoms very considerably.

Dr. Coates, referring to the practice of Dr. Parrish in the Pennsylvania Hospital, observes, that blisters appear of more service than cupping, "as they did not equally weaken the patient."

Emetics, as has already been intimated, deserve more attention as curative means in delirium tremens, than any other remedies that have been employed, *with the exception of opium*. In my own practice, I have had unequivocal testimony of the occasional usefulness of emetics in this malady. In several instances, however, they failed, in my hands, of doing any good; and in two cases, within the last six years, they were unequivocally injurious. To one patient, who had been long a confirmed drunkard, I administered, in divided doses, fifteen grains of tartar emetic. It produced neither purging nor vomiting; but its sedative operation was immediate and powerful. In about an hour after taking the medicine, the pulse became small and extremely feeble—the extremities ice-cold, and a profuse, cold, clammy sweat broke out over the whole body. The patient sunk rapidly, and expired about four hours after the antimony was taken. In the other instance, the emetic brought on the most profuse and exhausting diarrhœa, and soon prostrated the patient below the point of reaction. Nevertheless, in moderate and uncomplicated instances of the disease, and in patients who have still considerable constitutional vigor left, we may with safety, and often with decisive advantage, resort to one or two emetics. As an auxiliary or preparatory measure to the employment of opium, I am satisfied that the exhibition of an emetic is often peculiarly beneficial. I have known a few cases cured by *emetics*, with little or no other remedial applications; but experience has convinced me, that they are much more worthy of attention as *auxiliaries* to opium, than as a principal curative means. Dr. Brown expresses the same opinion. "Although it has not been our practice," he says, "to depend exclusively upon emetics in the treatment of delirium tremens, we can bear testimony to the utility, in some cases, of premising an emetic to the use of opium. And, no doubt, this is often an important step in the treatment of this disease."*

It is often extremely difficult in this disease to excite vomiting, without administering very large doses. Dr. Klapp gave one of his patients twenty grains of tartar emetic before vomiting was excited; and Dr. Brown mentions an instance in which thirty grains of this article were given before the desired effect was produced. I have, in general, preferred giving the tartar emetic in combination with ipecacuanha, in the proportion of two grains of the former with fifteen of the latter, repeated every ten or fifteen minutes, until vomiting ensues.

Cold and *tepid* affusions, also, have been recommended in this affection. Dr. Armstrong speaks favorably of the effects of dashing two or three gallons of *tepid* water, strongly impregnated with salt, over the whole body, and then immediately drying and rubbing the surface with warm flannel; and, having put the patient to bed, administering forty or fifty drops of tinct. opii, in a little warm wine. He informs us, also, that in several cases he used *cold* affusions with decided benefit; but he never resorted to this measure except in patients possessing much apparent vigor of constitution, and he always administered stimulants—such as warm wine—immediately afterwards.

Besides *opium*, various other stimulating remedies have been employed in delirium tremens. Dr. Coates considers *camphor* and *assafœtida* "as powerful

* Observations on Delirium Tremens, &c., by Dr. Stephen Brown, in the Med. Recorder, vol. v. p. 207.

agents in restoring the mind to its equilibrium." I have used camphor and opium in combination; but I cannot say that more benefit was derived from this mixture than is usually obtained from the latter article, when given by itself. In several instances, I gave the *camphorated tincture of opium*, during the *declension* of the disease, with the happiest effect. Two drachms of it may be given every three or four hours during convalescence. The carbonate of ammonia, also, may be given with more or less benefit in slight cases, or during the subsidence of the disease. I prescribed this article lately in a case of incipient delirium tremens, with marked advantage. With regard to the employment of *ardent spirits*, I can say nothing from my own experience, as I have never allowed my patients to take anything of this kind, except warm wine, and, in a few instances, a little weak brandy toddy. The sentiment of the profession appears now very generally and strongly opposed to the employment of spirituous liquors in the treatment of this affection. There is, indeed, something very revolting in the idea of exhibiting copious draughts of the very agent whose destructive influence has caused the wreck of body and mind, which we are called on to remedy. There can be no doubt that opium will, in general, do all that can be effected by remedies of this kind; and where it may be thought advisable to bring in the aid of a more diffusible stimulus, camphor, ammonia, assafœtida, and Hoffman's anodyne, may be resorted to with propriety.

During the course of the disease and particularly during convalescence, the diet should be light, unirritating, and fluid. Animal broths will, in general, answer better than anything else.*

CHAPTER III.

LOCAL CHRONIC NERVOUS AFFECTIONS.

SECT. I.—*Neuralgia—Tic Douloureux.*

THE first account of this affection was given in 1756, under the name of *tic douloureux*, by M. André, of Versailles. Ten years after this short and rather indistinct description was given, Dr. Fothergill published a paper, in which this painful affection is clearly and very circumstantially described, under the name of *faciei morbus nervorum excrucians*, and since that period, various interesting and elaborate essays, and a multitude of cases, illustrating the character and treatment of this disease, have been given to the public. The term *neuralgia*, which was, I believe, first given to the disease by Dr. Meglin, of Strasburgh, is now generally, and certainly with much propriety, preferred to the name of *tic douloureux*.

Neuralgia is usually divided into different species, according to the seat of this affection; but the fact, now well ascertained, that its attacks are confined to no particular nerve or system of nerves, that it may occur in almost every sentient structure of the body, in the cerebro-spinal, the pneumogastric and phrenic nerves,

* [I caught an excellent idea some years ago from the inaugural thesis of a candidate for the degree of M. D. He was a pupil of Dr. Hunt, a distinguished practitioner of Northampton, Mass. He gave his preceptor the credit of having cured several cases of mania-à-potu by a novel plan of treatment, which consisted chiefly in removing all appearances of restraint or confinement, allowing the patient to wander about the house and out of doors until he wore down the morbid excitability of his brain and nervous system. I have often since acted upon that idea, and tranquilized patients into a sound sleep after all other plans of treatment have failed.—Mc.]

and even in the ganglionic nerves arising from the solar plexus, renders the propriety of such divisions as specific distinctions very doubtful; and the more so, as they do not appear to involve any essential peculiarities, either in a pathological or therapeutic point of view. Unquestionably, however, certain nerves are much more liable to become the seat of this affection than others; and this is especially the case with the three grand divisions of the fifth, and the facial portion of the seventh pair of cerebral nerves.

Symptoms.—The pain in neuralgic affections is very peculiar. It is extremely acute, and darts like lightning from its more fixed point along the course of the nerves. It comes on in sudden paroxysms, with longer or shorter intervals of more or less complete freedom from suffering. In general, much pain is experienced throughout the whole paroxysm, with frequent transitory shocks of darting pain, so extremely agonizing as often to cause a temporary loss of reason and consciousness. Occasionally, the paroxysm consists of a succession of transient fits of pain, coming on with the suddenness of an electric shock, with short intervals of comparative ease. During the paroxysms, the surrounding parts are extremely sensitive or tender to the touch; and it is a remarkable circumstance, that the slightest touch, in many instances, causes much more suffering than firm pressure; the former, generally, instantaneously bringing on a shock of the piercing nervous pain. In general, the pain is attended with considerable turgescence of the blood-vessels in the immediate neighborhood of the affected part; and this vascular engorgement, says Dr. Macculloch, sometimes "amounts to a species of inflammation, resembling that of rheumatism." Much general soreness in the part is usually left after the subsidence of the acute neuralgic pains; but in some cases only a little tenderness remains, which gradually subsides, and leaves the patient in his ordinary state of health. In very violent attacks of the disease, we generally find the neighboring muscles affected with spasms, and occasionally spasmodic twitches occur in the muscles of parts distant from the place where the pain is located. When the disease occurs in the nerves of the face, the saliva is often secreted very copiously, and, in nearly all instances of this kind, there is a profuse flow of tears from the eyes during the paroxysms. In individuals of a nervous temperament, it is not uncommon to observe sympathetic affections of other and distant nerves, with which those affected have no other connection than that which exists through the medium of the sensorium commune.

In some cases the paroxysms are strictly periodical in their recurrence, with regular intermissions of comparative health, the type being almost always quotidian. This periodicity of the paroxysm occurs only in what may be termed the acute or recent form of the disease; and is particularly pointed out by Dr. Macculloch as an evidence of the affinity or rather identity of this affection with intermittent fever. Sometimes the disease assumes a chronic character, continuing in irregularly recurring paroxysms for months or even years, with scarcely any intervals of entire freedom from uneasiness, ill-health, or suffering; and this is especially apt to be the case, when the disease occurs in consequence of some mechanical injury of a nerve.

This affection occurs much more frequently in the face than in any other part of the body. When the portio dura is affected, the pain usually commences on the side of the face, near the ear, and darts along the ramifications of the nerve to the angle of the jaw, the alæ of the nose, the angle of the mouth, external canthus of the eye, and along the temple to the forehead. Sometimes the pain radiates from a point on the cheek just below the orbit of the eye, and passes to the side of the nose, the upper lip, teeth, gums, and temple, in which case the disease is seated in the second branch of the fifth pair of nerves. When the principal pain is experienced in the internal canthus of the eye, forehead, eyelids, and in the ball of the eye, we may presume that the first branch of the fifth pair is affected; and in cases where the tongue and lower jaw are the seat of much pain, the neuralgic irritation extends to the third branch of the trigeminus. Sometimes the pain occurs in the scalp; and I have seen an instance of extreme

violence, in which the pains were most severely felt behind the ear, and along the scalp of the occiput and the posterior portion of the temporal bone.

The *optic nerve*, also, has been known to be affected with neuralgia. Dr. Macculloch mentions a case in which the pain in the eye was described by the patient as if a red-hot needle had been passed through its centre.* The decidedly neuralgic character of this pain was evident from its having occurred the moment after an attack of neuralgia in the upper jaw had ceased.†

Neuralgia in the nerves of the extremities is by no means uncommon. Dr. Macculloch mentions a severe case that occurred in the radial nerve which runs along the metacarpal bone of the fore-finger. The pain was confined to a space "which a pea could have covered," and continued during a period of four months. Mr. Abernethy has related a striking instance of neuralgia, which affected the superficial nerves under and adjoining the inner edge of the nail of the ring-finger of the hand;‡ and Dr. Pearson has given an account of a remarkable case affecting the extremity of the left thumb.§

The occurrence of this affection in the nerves of *the feet and legs* has been frequently noticed. I have lately seen an instance of this kind which has already lasted upwards of six months. Dr. Good, who makes a distinct species of such cases under the term *neuralgia pedis*, describes an instance of this kind which continued for several years. The paroxysms were transient, of uncertain recurrence, and so severe as nearly to cause fainting, darting up the calf of the leg towards the knee, and downwards into the toes. Dr. Macculloch relates instances of neuralgia of the *knee*. In two extremely violent cases, the pain was situated immediately over the margin of the head of the tibia, and the affected part was not more than an inch in area. In another case, imitating the double tertian type, "there was on one day pain in both knees, and on the alternating day a pain in one arm;" and in this way the disease continued a long time. Neuralgic pains in this joint, says this writer, have been mistaken for scrofulous affections, "and in some cases that had lasted five years, as the pain was very severe, the surprise had long been that no swelling could be discovered by the touch." This affection is what Mr. Brodie has described under the name of *hysterical white swelling;* and he appears to think, "that nine out of ten of those unfortunate young women who have been *doctored* of late years for *spinal* diseases, have really labored under nothing but *hysterical pains* of the back."‖

The *tibia* has been frequently the seat of extremely violent neuralgia; and it has also occurred in the *thigh*, particularly in the anterior crural nerve, shooting down with great severity, from near the groin to the foot or toes.

The occurrence of neuralgia in *the breasts of females* has, of late years, been noticed by several writers. The third species of Dr. Good's subdivision of this affection (*neuralgiæ mammæ*) is founded upon this location of the disease. He describes an interesting case of this kind. "The breast," he says, "was full-formed and soft, without the slightest degree of inflammation or hardness. When the paroxysm of pain was not present, it would bear pressure without inconvenience, but during the pain the whole breast was acutely sensible. The paroxysms returned at first five or six times a day, and were transient; but as the disease became more fixed it became also more severe and extensive, for the agonizing fits at length recurred as often as once an hour, and sometimes more frequently." Dr. Addison says, that neuralgic pain *under the mammæ, or under the margin of the ribs of the left side*, is far from being uncommon in females. This pain, he observes, is "very circumscribed, and will often last for weeks or

* An Essay on the Remittent and Intermittent Diseases, including, generically, Marsh Fever, and Neuralgia, &c. By John Macculloch, M. D.

† [This pain must have been felt by a filament of the first branch of the fifth pair. According to sound physiology, the other is a nerve of special sense, and can never experience common sensation.—Mc.]

‡ Surgical Works, vol. ii. p. 18.

§ Med.-Chir. Transact., vol. viii. part i.

‖ Med.-Chir. Rev., Nov. 1828, p. 58.

even months, with but little intermission. It is often associated with palpitation of the heart, or what is much more unusual, with unnatural pulsation of the organ, *i.e.*, the patient is conscious of the heart's action, or she feels as if its impulse were communicated to a part so sensitive as to excite distinct sensation."*

The *internal organs*, as was observed above, are no less liable to neuralgic affections than the external parts. Of the *neuralgia of the heart*, I shall speak more particularly under the head of angina pectoris; for it will scarcely admit of a doubt that in some instances at least, this appalling affection is strictly of a neuralgic character. The occurrence of neuralgia in the abdominal viscera appears also to be much more common than is generally suspected. Dr. Macculloch has met with a well-marked instance of neuralgia in the rectum. There is an affection of this kind which occasionally occurs at the extremity of the rectum or coccygis, immediately after parturition, causing indescribable suffering to the patient, and which scarcely any dose of laudanum is adequate to allay. Dr. Dewees, in his *Midwifery*, mentions a remarkable instance of this kind, and I have not long since met with one equally striking. The pain continued for two hours before it began to decline.

The *painful affection usually termed gastralgia*, is probably purely neuralgic in its nature. In this variety of the disease, the pain is paroxysmal, sometimes quotidian, and usually radiates from the epigastrium to the thoracic parietes, the back, and to the shoulders. The tongue is white, the saliva abundant, without thirst, and epigastric tenderness on pressure. Immediately after eating, the pain generally abates for some time, but in the course of one, two, or even three hours afterwards, it is renewed with a feeling of weight and distress in the epigastrium, as if there was a foreign body in the stomach. Nausea, borborygmi, flatulent colic, and eructations of air, are usually experienced some hours after eating. There is generally much constipation, and the urine is usually pale, and small in quantity. In violent and protracted cases, difficulty of breathing, palpitation of the heart, wandering pains, and a peculiar sensation of coldness in the arms, loins, and lower extremities are wont to occur. In the morning the patient commonly gets up refreshed, and feels quite well until breakfast renews the gastric pains.† Dr. Prus has recently reported a very interesting case of neuralgia of the stomach, which was brought on by violent mental emotion. The patient, a female, was affected with excruciating pains in the epigastrium, which came on daily in paroxysms, between the hours of three and half past seven P. M. *Fourteen* years after the commencement of her sufferings, the patient consulted Dr. P. The epigastric pain was removed in five days by full doses of quinine, given during the intermission, and the patient appeared to be entirely cured. On the twenty-second day afterwards, however, intense pain occurred in the course of the infra-orbital nerve; soon afterwards it seated itself in the cubital nerve of one arm, where it remained but a very short time. It then returned to the face. A blister was now applied beneath each trochanter. After this the sciatic nerves of the right side became violently painful. Blisters were applied along the course of the nerve, and in a few days more the pain suddenly shifted to the *left* sciatic nerve, and soon afterwards disappeared altogether.‡ The *kidneys*, also, may become the seat of this affection. Dr. Macculloch states that he has met with an unequivocal instance of this kind. There is an exceedingly painful affection which occurs in the right iliac region, usually confined to a very circumscribed space, and which has been generally regarded as the result of calculous irritation in the ureters, but which appears, very manifestly, I think, to be purely neuralgic.

* Observations on the Disorders of Females; connected with Uterine Irritation. By Thomas Addison, M. D., &c., Lond., 1830.

† For a detailed account of the diagnosis between *gastralgia* and chronic *gastritis*, see the section on gastritis, p. 166 of this work.

‡ Med.-Chir. Rev., March 1829, p. 553.

I have met with five or six cases of this kind, several of which continued to recur daily for two or three months. Its mere *nervous* character seems to be demonstrated by the strict periodicity which it observes in its recurrence; although in most instances there is retraction of the testicle on the affected side, as in calculous irritation, without, however, any difficulty or diminution of the discharge of urine.

The uterus also is liable to become the seat of extremely painful affections of this kind, in females of a nervous or hysterical temperament. Dr. Jolly, in the second part of his memoir on *Visceral Neuralgia*, has reported some severe and well-marked cases of neuralgia of the uterus. In one instance, the affection assumed a strictly quotidian intermittent type. After some manifestations of catamenial irregularity, the patient became affected with violent pains in the right iliac region, shooting into the pelvis, and extending to the left iliac region. These pains were acute, lancinating, recurring every three or four minutes, and soon acquired such a degree of violence, as to cause some delirium, and even convulsions. The attacks came on about noon, and continued until the evening. On the following morning, the patient appeared in good health, and without any pain, but about mid-day the paroxysms returned. After trying a variety of means ineffectually, eight grains of quinine were given during the remission, and the paroxysms were arrested. Mr. Jolly relates another highly interesting case of neuralgic affection of the trisplanchnic nerves, which assumed the tertian type. The patient, a lady, aged thirty, soon after accouchement, experienced most violent attacks, which resembled gastritis, nephritis, hepatitis, hysteritis, &c., according to the organ principally invaded. Active depletory measures were employed, until the patient was reduced to a very low state, without any permanent favorable impression being made on the disease. At last, recourse was had to quinine and opium, during the intermissions, and under the use of these remedies the disease yielded speedily.* Mr. Shaw has related a case, where the neuralgic affection was seated in the ulnar nerve, from the elbow to the little finger. After some local rubefacient applications, and the internal use of blue pill, and the volatile tincture of valerian, the pain abated in the arm; but the patient (a female) was attacked with severe pains in the *uterus*. It would seem, too, that neuralgia sometimes invades the *bladder*. In a conversation which I lately had with Dr. Parrish, he mentioned an instance that occurred in his practice, which he called *tic douloureux* of the bladder.

M. Martinet has related some singular instances of neuralgia,† which assumed the general appearances of cerebral disease. One case commenced suddenly with incomplete paralysis of the right lower extremity, attended with pain running along the sciatic nerve; next a dull pain, with formication, occurred in the region of the loins—in a few days afterwards pains radiating along the temples, forehead, and upper eyelid of the right side, came on—then distortion of the mouth to the left side, embarrassment of speech, with pain in the facial nerves, darting pains along the scalp, deep-seated cephalalgia in the right side of the head, and finally uneasiness in the epigastrium, coated tongue, &c. The case was cured by leeching and purgatives. He mentions another instance still more closely simulating disease of the brain. A very singular case is related by M. Hellis, of Rouen. The patient, a young man, aged about 15, at first felt a dull pain near the last dorsal vertebra, which soon extended itself to the epigastrium, attended with hiccup. In this situation he continued, with occasional intervals of weeks or months, for several years: at last the pains did not confine themselves to the back and epigastrium, but darted through the chest, abdomen, and down the legs to the toes. It also affected the upper extremities, and passed along the course of the nerves to the extremities of the fingers. On closing the hand, the

* Bib. Med., Juin 1828. See also Med.-Chir. Rev., Sept. 1828.

† Rev. Médicale, Janvier 1824.

hiccup and pain would cease, but "on extending a single finger it would appear, and quick as lightning traverse the parts just mentioned."*

From the foregoing facts, we perceive that neuralgic irritation is by no means confined to a few points of attack; and we shall presently make it appear that its causes are scarcely less various than the parts which are susceptible of becoming its seat.

Causes and pathology.—Dr. Macculloch strenuously insists on the *malarious* origin of neuralgia, and there can scarcely exist a doubt, indeed, that in many instances, neuralgic affections are nothing more than masked agues from the influence of koino-miasmata. In miasmatic districts, the occurrence of affections of this kind is far from being uncommon; and their close affinity to intermittent fever seems to be sufficiently demonstrated by the strict periodicity of their character; and the remedies most successful in removing them, being the same that are most effectual also for the cure of fully developed intermittents. The symptoms, too, which on a careful examination may be detected in many instances of periodical neuralgia just before the accession of the paroxysms, indicate the close alliance between them and intermittents. "Immediately before the attack," says Dr. M., "if the pulse be examined, it will be found to put on that character which it possesses in the cold stage of intermittents, while through the progress of the paroxysm it passes through the other analogous changes." There are also, most commonly, "some indications of a cold stage, generally obscure, it is true, as is the case in most of the anomalous and chronic intermittents, but still discernible." There is much reason to believe that individuals who have labored under intermittents, may afterwards, even at remote periods, have relapses of the disease in the form of periodical neuralgia. I have seen two instances of this kind, of great severity, which yielded readily to the powers of arsenic given during the intermissions. True as it undoubtedly is, that many cases of this affection arise from the influence of koino-miasmata, and partake of the nature of intermitting fever, it is nevertheless far from being so generally dependent on this cause as is alleged by Dr. Macculloch. It is manifest, indeed, from the many cases that have been published of late years, that this painful affection may be originated by a variety of very distinct causes, some of them of a general, and others of a strictly local character. Sometimes it appears to be dependent on a morbid irritability and irritation in the intestinal canal; and this is probably most commonly the case when the affection occurs in the nerves of the mammæ, on the side of the head, and in the heart, producing angina pectoris. I have seen an instance of excruciating pain and tenderness in the left breast, between the nipple and the axilla, without inflammation, swelling, or redness, in a lady habitually affected with gastric disturbance. It was removed by a course of simple diet, mild tonics, blue pill, aperients, and laxative enemata.

The occurrence of neuralgia from *mechanical injury* of the nerves is by no means uncommon. In many instances of this kind, the neuralgic pains are seated at a distance from the part where the primary irritation or injury exists; but in others, the affection is located immediately in the injured nervous ramifications. Sir Henry Halford has lately adduced some observations, which would seem to show that facial neuralgia is occasionally excited by *lesion of bone.* In one of the cases he relates, "there was an exostosis of the alveolar process—in another there was disease of the antrum Highmorianum; and in a third, and the most remarkable of all, there was a prodigious deposit on the internal surface of the skull, like frost-work, which must have caused great pressure on the brain. Dr. Pemberton, previously to the development of the neuralgia of which he died, was twice affected with abscess in the frontal sinuses."† In a case of neuralgia of the face, Dessault found the foramen through which the nerve passed in a diseased state.

* Med.-Chir. Rev., Oct. 1826. Journal Générale de Méd., April 1826.
† Med. Chir. Rev., April 1828.

Many cases are on record where neuralgia was produced by accidental injuries, such as wounds, bruises, &c. M. Feron has related an interesting instance of this affection, which was produced by a bite from a little girl in a state of delirium, inflicted on the back of the second phalanx of the little finger of the left hand in an old lady. In a few days, excruciating pain was experienced in the little finger, spreading successively to the hand, forearm, and elbow, along the track of the cubital nerve. After cauterizing the wound, the pain extended to the axilla, and increased in severity; at last a sense of stricture and fullness or stuffing in the chest ensued, which was soon succeeded by violent cardialgia and vomiting. These symptoms, recurring in paroxysms, lasted six months.* A most distressing case is related, which was caused by a wound of the hand from the explosion of gunpowder. Amputation of the arm was twice performed, but the disease always returned in the stump as soon as it was cicatrized. The patient visited Paris, London and Edinburgh, where he consulted the most eminent of the faculty, but he derived no permanent advantage from the measures that were recommended. I once saw a case of great violence, which was produced by a fracture of the forearm. I have not heard whether the disease was ultimately removed or not. Dr. Jeffrey has recorded a very aggravated case, which was caused by a wound in the cheek by a piece of chinaware, a small portion of which remained imbedded in the wound. It may also arise from the irritation of a carious tooth. Mr. Swan has given the history of a case of facial neuralgia, which was produced by a blow on the right eye.

With regard to the proximate cause of neuralgic affections, pathologists have expressed a diversity of opinions. Dr. Parry attributed the pain to "increased vascularity or determination of blood—perhaps amounting to inflammation—of the neurileme or vascular membranous envelop of the affected nerves." M. Vaidy, who has published a valuable memoir on this disease, entertains a similar view of its pathology. He considers all neuralgic affections as consisting in inflammation of the nervous tissues.† The affected nerve, or its neurileme, has indeed sometimes been found preternaturally vascular and injected; yet these conditions may be the *consequence*, and not the *cause* of the neuralgic irritation. The nerves, says Mr. Swan, are liable "to become enlarged and inflamed from irritation, just as muscles are from continued action; but dissection, he says, has not shown those depositions of coagulable lymph and structural changes which are produced by continued inflammations of the other parts of the body, and of the nerves themselves in stumps and portions along the seat of inflammatory action."‡ The general opinion at present is, that this painful affection is frequently the result of mere nervous irritation, without any necessary connection with vascular congestion or inflammation. Without doubt, however, inflammation or increased vascularity of the neurileme may give rise to the disease; and it may, I think, be assumed as a fact, that neuralgia may depend on different causes—on local inflammation or congestion of the affected nerve—on organic disease of the brain—and most commonly on a sympathetic irritation, from latent irritation in other parts or organs.

Diagnosis.—The diagnosis of neuralgia is not, in general, attended with difficulty, unless it be seated in the internal organs. The pain, as has been stated, is darting, extremely acute, paroxysmal, and usually transient, coming on with the suddenness of an electric shock, and ceasing as instantaneously. These circumstances, together with the exceeding aptitude of the slightest touch or motion of the affected part to renew the paroxysm of pain, and the entire absence of swelling or inflammation, and usually of heat in the part, and finally, the transient radiations of the pain along the course of the nerves, are sufficient to distinguish this disease from other painful affections.

* Med.-Chir. Rev., Sept. 1821, from the *Journal Complément.*, Mai 1820.

† Journ. Complément., Dec. 1820.

‡ Dissertation on the Treatment of Morbid Local Affections of the Nerves. By Joseph Swan, &c.

Treatment.—The mode of treatment must of course be diversified, according to the nature of the exciting cause, and the extent and situation of the neuralgic affection. A case produced by local injury of the nerve will scarcely yield to the same treatment that will be required for one which arises from the influence of miasmata; and an instance depending on this latter cause, will probably yield to remedies that would fail in one which originates from gastric irritation, and a general morbid irritability of the system. Formerly, considerable reliance was placed on dividing the affected nerve; but although no inconsiderable number of cases have been related, where this operation effected a cure, it is but seldom that it can be resorted to, on account of the number and situation of the affected nervous ramifications; and where the disease depends on a sympathetic irritation, or a local injury nearer the origin of the nerve than can be reached with the scalpel, there would appear to be but very little or no chance of advantage from this measure. Mr. Swan, in speaking of this operation when the portio dura* is affected, says, that the attempt to divide the trunk of this nerve is not only attended with much difficulty, but also with danger; and "to divide all the branches that go to the face, requires an incision from the zygoma to the angle of the jaw. The greatest portion may be divided by making an incision down to the jaw, a little below the zygoma, and thus the main branches of the nerve will be cut through; and if the patient is not relieved by the operation, another incision may be made quite to the angle of the jaw, by which nearly all the principal branches will be divided." When the disease is located in the third branch of the trigeminus, in which case the pain is felt in the side of the tongue and the teeth, the attempt to divide the nerve would be dangerous. When, however, the pain occurs in the lower lip, the nerve may be divided as it passes out of the lower jaw, by passing the point of a knife between the lip and the bone at the first bicuspid, down to the foramen, and moving it a little from side to side.† Notwithstanding the difficulty and hazard of dividing the trunk of the portio dura, a very interesting example of the performance of this operation, by Dr. Warren, of Boston, is related in the sixth volume of the *Medical Recorder*. The patient had labored under the disease for fourteen years, and had already undergone the operation of dividing the infra-orbital nerve, and the first branch of the trigeminus. The pain passed from a point near the ear over the side of the face. "A dissection was made between the back part of the parotid gland, and the mastoid process," the nerve exposed and a portion removed. The pain nevertheless returned. He now cut down over the side of the jaw, through the parotid gland and masseter muscle, removed a portion of the bone with the trephine, and exposed the nerve where it enters the lower jaw, and removed a piece half an inch long.‡ This completed the cure.

In cases of neuralgia in the nerves of the extremities, the *removal* of a portion of the affected nerve has been practised with success in no inconsiderable number of instances. Mr. Earle has reported a case§ where the complaint was cured by cutting out a portion of the nerve; and Mr. Abernethy cured a case

* [The portio dura can never be the seat of neuralgic pains. I have had many opportunities of proving the truth of Sir Charles Bell's doctrine upon this subject in my observations upon the living body. It is totally insensible to the irritation of instruments of every kind, and is purely a nerve of motion, imparting both voluntary and involuntary powers to the muscles of the countenance. When we have excited pains in our operations near the trunk of this nerve, they have arisen from a disturbance of the superficial temporal, the only sensitive nerve in that vicinity. Irritation of the portio dura produces a muscular rigidity or contraction of the vessels which it supplies, and division or compression, or simple impairment of its energy, produces an atonic muscular paralysis of the same parts.—Mc.]

† Loc. cit., p. 56.

‡ [This last operation divided the inferior sensitive branch of the trigeminus—the real seat of the disorder. The first operation on the *portio dura*, which does not enter the lower jaw, was necessarily unsuccessful in the way of relieving pain, and could only have produced an incurable paralysis of the muscles.—Mc.]

§ Med.-Chir. Transact., vol. vii.

seated in the integuments of a finger, by removing about half an inch of the digital nerve. The propriety of *removing*, instead of merely dividing the nerve, is founded, in part, on experience, and on the fact ascertained by Sir Everard Home and others, that when a nerve is merely divided, and the extremities left close together, they regain the power of transmitting the nervous influence in a few days. M. Lisfranc cured a case of neuralgia of the scalp, caused by an external injury "by removing an oval piece of scalp, including the seat of the pain, three inches in length and two in breadth."* The practice of dividing the neuralgic nerve has, however, so frequently—we may say, so generally—failed, that it is now almost entirely abandoned by practitioners. Where the disease is confined to a single branch, and arises from local irritation, it may, nevertheless, be resorted to with some prospect of success, and ought most assuredly to be employed, where all other remedial measures are ineffectual.

In recent cases, depending on a constitutional cause, where the paroxysms recur *periodically*, tonics, particularly quinine and arsenic, will most frequently remove the disease. Instances of this kind, as has been stated, are generally of malarious origin, and will commonly yield to the same mode of treatment that is usually adopted for the removal of intermitting fever. Indeed, neuralgia of this kind sometimes disappears spontaneously, just as intermittents are known to do, without any medicine. About two years ago, I attended a lady laboring under quotidian paroxysms of the most excruciating neuralgic pains in the portio dura. The autumn previous she had been affected with protracted intermittent, and as she had taken a great deal of quinine, which always affected her head very disagreeably, she now obstinately refused to take it. I therefore directed a blister to be laid on the epigastrium, and put her on a very simple farinaceous diet. In three days the neuralgia ceased, and has not troubled her since.

Dr. Macculloch, whose experience in cases of this kind appears to have been very extensive, says that the *Peruvian bark* and *arsenic* are decidedly the most efficacious remedies in *intermittent* neuralgia; and this observation is confirmed by the experience of others. Mr. Shaw has used bark with marked success in neuralgic complaints; and Dr. Kerrison asserts, that, according to his experience, cinchona is the most useful medicine we possess in cases of this kind. M. Vaidy also cured an instance of facial neuralgia, which came on with extreme violence every day at twelve o'clock, and lasted four or five hours, by means of the cinchona.† Five or six years ago, I met with a few cases of well-marked *intermitting* facial neuralgia, which yielded readily to large doses of quinine; but in one instance, of a strictly quotidian type, which more recently came under my care, neither this remedy nor arsenic made the slightest impression on the disease. Many cases might be collected from recent medical publications illustrative of the good effects of tonics in periodical neuralgia. MM. Ribes and Dupré have reported an interesting case, which was speedily removed by the *quinine;*‡ and M. Piédagnel succeeded, in a very short time, in curing this affection with this tonic.§ Dr. Lalaurie, physician to the Central House of Correction at Eysson, has related an instance of neuralgia which originated from a puncture of a ramification of the frontal nerve, and which continued for *ten* years. *The attacks came on periodically.* The patient was ordered to take every morning the sixteenth part of a mass, composed of a drachm of white soap and a grain of *arsenious acid;* drinking immediately afterwards three cups of water containing mucilage and honey. This was repeated every other day, and in two weeks the disease was entirely removed. From the observations that have been published, it appears, therefore, that in *intermittent*, quotidian, or tertian neuralgia, and in these only, do the tonics just mentioned manifest any particular curative powers; and in all such cases, whether originating from general

* Med.-Chir. Rev., July 1826.
† Journal Complément, December 1820.
‡ Magendie's Journal de Physiologie, 1822.
§ Lond. Med. Repository, 1821.

or local causes, they ought certainly to be fully tried before recourse is had to other modes of treatment.

No article of late years has attracted more attention as a remedy in neuralgia, than the *carbonate of iron*. Mr. Hutchinson has published a small work on *tic douloureux*, in which he relates a considerable number of well-marked cases that yielded to the powers of this remedy.* It has also been used with success in this affection, by Mr. Richmond,† Dr. Crawford,‡ Dr. Evans,§ Dr. Brothwick,‖ Dr. Davis, Dr. Yates, Dr. Ayre, Dr. Marsden, Dr. Payne, Dr. Marshall Hall, and others. The cases related by Dr. Evans furnish very striking testimony of the sanative powers of this article, even in very protracted instances, and of great severity. It should be given in large doses—from one to two drachms, three times daily. This remedy appears to be best adapted to intermittent cases, attended with debility of the digestive powers. It is not, however, superior to the quinine or arsenic in such cases. I have in several instances resorted to it, but only with partial advantage. In one of these cases the disease was afterwards removed with the quinine.

Some of the *narcotics*, also, have been strongly recommended for the cure of neuralgic affections. The stramonium, especially, possesses very considerable powers against such pains. It was some years ago recommended by Dr. Marcet as a highly valuable medicine in these and other painful affections unattended with an inflammatory diathesis, and it is unquestionably entitled to much attention as a remedy in cases of this kind. Dr. Bigbee¶ has published a paper illustrative of the valuable powers of this article in painful affections of the nerves, and we have also the testimony of Dr. Elliottson, among others, in favor of its virtues in neuralgic complaints.** I have employed it in four cases of recent neuralgia, in two of which I succeeded, in the course of three or four days, in completely removing the disease. One-fourth of a grain may be given every four hours, until vertigo is produced, when its use must be omitted, and resumed as soon as the vertigo subsides. It has appeared to me most effectual in cases attended with, and probably mainly dependent on, a general irritable condition of the nervous system, or in what may be termed hysteric neuralgic pains. It must not be forgotten, however, that when given in repeated and active doses, it is very apt to produce a species of maniacal delirium, strongly resembling delirium tremens. In two instances, in which I prescribed it for chronic rheumatism, it had this effect. The *belladonna*, too, has had its advocates as a remedy in neuralgic complaints; but its powers as an internal remedy are certainly much inferior to those of stramonium in this respect. Mr. Bailey, however, speaks very favorably of its remedial effects in affections of this kind. He has related thirty cases in which the internal employment of this narcotic proved more or less beneficial. He began with three grains of the extract, and repeated it in small doses, at short intervals, until relief was procured. Mr. Todd states that he has cured several cases of painful affections of the nerves, by the *external application* of a strong aqueous solution of the extract of belladonna to the skin over the affected part. In one instance, where the pain was experienced along the course of the sciatic nerve, from the hip to the foot, almost immediate relief was procured by rubbing the track of the pain with a solution of two drachms of the extract of belladonna in an ounce of water. Another instance, of a similar character, was gradually removed in the same manner.†† Dr. Henry, an English surgeon, also has reported a case of this affection, treated successfully in this

* Cases of Tic Douloureux successfully treated. By B. Hutchinson. London 1820.
† Lond. Med. and Phys. Journ., No. cclxxi. p. 271.
‡ Ibid., 1823.
§ Edin. Med. and Surg. Journ., Jan. 1824. ‖ Ibid.
¶ Edin. Med.-Chir. Trans., vol. i. p. 285.
** Med.-Chir. Rev., June 1828.
†† Transactions of the Surgeons-Apothecaries, vol. i. article vi. On the Treatment of Painful Affections of the Nerves, arising from Local Injury. By George R. Todd, Esq., &c.

way, and in the *Revue Médicale*, for January, 1830, Dr. Claret has given the details of six cases of neuralgia, which yielded entirely to this treatment. He employed the extract by frictions. "Five or six frictions, with the extract of belladonna, were sufficient to cure a severe case of neuralgia in the supra-orbital nerve." In another case the cure was effected by two frictions; and in a third case, one friction, with ten grains of the extract, was sufficient to remove the complaint.* I have lately resorted to this practice in a case of neuralgia in the sciatic nerve, with unequivocal advantage.†

The *oil of turpentine*, likewise, has been used with success in certain neuralgic affections. M. Sedillot‡ cured several instances of sciatic neuralgia, by administering this article in drachm doses once or twice daily; and Dr. Wilson, in a communication to Dr. Johnson, states, that "in three cases of neuralgic disease which had lately come under his care, a cure was effected by the combination of calomel, opium, and the *oil of turpentine*." A pill, containing from two to four grains of calomel, and one or two grains of opium, was given each night at bed-time, and next morning one or two drachms of oil of turpentine, mixed with a little honey. In each of the three cases, a complete and permanent cure was effected by this plan, and in a moderate space of time. It is more especially in sciatic neuralgia, however, that this article has been found particularly efficacious; although it has also been used with success in other varieties of the disease. M. Martinet has published a paper on the use of this remedy in neuralgic affections of the hip and extremities, in which he asserts that of seventy cases, fifty-five were cured by the internal administration of turpentine; and many of these cases had previously been subjected to various other modes of treatment, without advantage.§ M. Récamier, of the Hôtel Dieu, also speaks in high terms of the efficacy of the oil of turpentine in neuralgia.

Leeching has, of late years, been employed in neuralgic affections; and from some accounts that have been published, it would appear that benefit may be derived from this measure in certain cases of the disease. Without doubt, where the malady depends on an inflammatory condition of the nerve or its neurileme, the local abstraction of blood is well calculated to do good; but it is by no means probable, I think, that any advantage can be derived from this measure in cases connected or dependent on constitutional causes; and there are instances on record where it did much harm, as in the remarkable case related by Dr. Yeates.‖ M. Vaidy has reported cases which were cured by the application of leeches along the course of the nerve. (*Loc. cit.*)

Of the *local applications* that have been employed in this affection, *moxa* is, without doubt, the most efficacious. Larrey relates cases that were removed by this remedy; and Dr. Barras has given an account of a case of neuralgia of the spermatic cord which yielded to this application. M. Feron has reported a highly interesting instance of neuralgia of the ulnar nerve, which was removed almost immediately by the application of moxa near the elbow. In four or five months, however, the disease returned; but the moxa now procured only a temporary mitigation of the patient's sufferings. Larrey advises that the moxa be applied repeatedly, if the first applications afford only partial relief. He has repeated the burning ten or twelve times, and followed the pain with the moxa wherever it fixed itself, before the disease was completely subdued.¶

* North Amer. Med. and Surg. Journ., vol. x. p. 194.

† [The extract of aconitum has of late been much used for the same purposes. From its power of benumbing the sensations, it would appear to be especially calculated to afford relief in neuralgic pains.—Mc.]

‡ Medico-Chir. Review.

§ Revue Médicale, Nov. 1828, p. 222.

‖ A History of a severe case of Neuralgia, occupying the nerves of the right thigh, leg, and foot.

¶ [Blackening the cuticle over the origin and course of the pain with the repeated application of a strong solution of lunar caustic, often affords relief.—Mc.]

M. Vaidy has mentioned a case of neuralgia of the sciatic nerve, from the hip to the foot, which was speedily and permanently removed by a *tight bandage* applied over the whole extremity. *Acupuncturation* has also been resorted to with success in this painful affection. M. Pelletan relates a considerable number of neuralgic cases that were completely cured by one or two operations of acupuncture. It does not appear, however, that it has yet been employed with success in facial neuralgia. In the cases mentioned by M. Pelletan, the crural, the sciatic, and the plantar nerves, and in one instance the superficial nerves of the chest, were affected.*

A case of facial neuralgia is related by Mr. Beddingheld,† in which the application of cerussa, with the view of paralyzing the affected nerve, proved entirely successful. The case was under the direction of Sir Astley Cooper, and had previously resisted every other remedy. Two scruples of the cerussa, formed into an ointment, were rubbed on the affected cheek every morning, about an hour before the paroxysm was expected. By continuing this application daily for a month, the disease was completely removed.

The application of a *strong magnet* has also, in a few instances, promptly removed the pain in neuralgia of the face. M. Alibert, in his treatise on materia medica, mentions some examples of this kind; and a remarkable case of this kind occurred in my own practice about eighteen months ago. A gentleman of this place daily experienced the most agonizing paroxysms of neuralgic pain in the ramifications of the portio dura.‡ Quinine, the carbonate of iron, arsenic, and belladonna were used, but without the least advantage. At last I sent him a strong horse-shoe magnet, and directed him to keep it applied on the side of the face, so as to bring the two poles opposite to the meatus auditorius. He did so. In about two hours after the magnet was applied the pain became more severe than ever, so as nearly to deprive the patient of his consciousness. Suddenly, however, the pain ceased entirely, and I found him calm and cheerful in the evening. On the following day the magnet was again applied, and the paroxysm was very slight, and not more than one-third the usual duration. In the course of five or six days further, the disease was wholly removed. Was this a mere coincidence?—or did the magnet control the neuralgic irritation? It is certain that intermitting neuralgia sometimes terminates spontaneously, and it is *possible* that this may have been the case in the present instance.

Professor Von Hildenbrand, of Pavia, employs a bundle of metallic wires (*facis et filis metallicis confectum*), not thicker than common knitting-needles, firmly tied together by wires of the same material, so as to form a cylinder about four or five inches long, and one inch or three-fourths of an inch in diameter. This is applied to the pained parts, previously moistened with a solution of sea-salt, when, as he asserts, it produces almost instantaneous relief. Occasionally, says Dr. Hildenbrand, the neuralgic pain is immediately entirely extinguished, with the accompanying effect of a peculiar sense of emanation from the spot to which the metallic bundle or brush is applied. On withdrawing the brush, the pain occasionally returns, but in a much less violent degree.§

* Revue Médicale, Janvier 1825; and Archives Générales, Fevrier 1825.

† Compendium of Medical Practice.

‡ [This pain could not have been seated in the portio dura. I repeat, it must have been in the trunk of the superficial temporal nerve which supplies sensibility to the parotidial and middle temporal region.—Mc]

§ To illustrate the extraordinary remedial effects of this agent, Dr. Hildenbrand relates the following case: "A man aged 30, affected with violent *tic douloureux* of the face, was admitted into the clinical wards of Pavia. On applying the metallic brush over the left frontal nerve, the pain immediately disappeared from that one, but fixed in the corresponding nerve of the right side, which had been previously free from pain. The very moment at which the brush was removed from the left frontal nerve, the pain returned to its original seat, and there remained, though already greatly abated in intensity. By applying a metallic brush to each supra-orbital nerve simultaneously, the original neuralgia of the left side was removed, without again appearing in the opposite side."

Within a few years past, much attention has been directed to the origin of the spinal nerves, in neuralgic affections of the trunk and extremities of the body. From the interesting observations of Teale* and Tate,† it appears, that in many cases of neuralgic pains in the chest, abdomen and extremities, much tenderness to pressure exists in the region of one or more of the vertebræ. They assert that the application of leeches, or cups, or as Teale particularly recommends, tartar emetic ointment, so as to cause pustulation over the tender part of the spine, will very generally speedily remove the painful affection. They report some striking cases of the value of this practice; and the recent periodical medical publications furnish interesting testimony from other sources, in confirmation of their experience.

An attention to proper dietetic regulations, and to the restoration or maintenance of the regular action of the liver and bowels, is of much importance in affections of this kind—more especially where the disease is attended with manifest symptoms of gastric derangement.‡

Gastralgia.§—For mitigating or removing this painful and distressing affection, which appears to be purely neuralgic, various remedies have been recommended; but they have seldom afforded more than temporary relief. *Opium* in full doses will indeed always procure perfect ease for a time; and there are few who are much affected with this complaint who do not find it necessary to resort to this narcotic. The misfortune, however, is, that those who have once experienced the delightful effects of this medicine, when suffering under an attack of gastrodynia, will repeat it again and again, whenever the pain returns, and as the dose must be progressively augmented, the unfortunate sufferer will almost inevitably contract a habit of taking it in enormous and ruinous quantities. Dr. Dawson‖ observes: "It may be said that opium is a great evil; it is so; a most painful necessity; but it is a far greater evil to pass one half of life in excruciating pain, and the other half in miserable anticipation. The gastrodynic sufferer has

If, in cases of this kind, the pain is purely *nervous*, without inflammatory irritation or change of structure—in which case its attacks are always periodical, with perfect intermissions of freedom from pain—"then the efficacy of the metallic brush may be pronounced infallible. But if the pain be continuous, or at least void of perfect intermissions, or if it is aggravated by pressure, or attended with redness, heat and swelling, in short, if there is reason to believe that the neuralgia is attended with active congestion or sub-inflammatory irritation, then the metallic brush will afford no benefit, nay, it may augment the severity of the pain."—*Edin. Med. and Surg. Journ.*, vol. xxxix., p. 492.

* Teale on Neuralgic Diseases.

† Tate on Hysteria, &c.

‡ [Dr. Eberle has undervalued the operation of dividing the sensitive nerves, which are the actual seat of neuralgia. Before the distinction between the two classes of sensitive and motor nerves was understood, surgery often failed in consequence of dividing the wrong nerve, as the portio dura instead of one of the branches of the trigeminus, or the ninth pair instead of the gustatory. When they cut on the distal side of the affected part, they also must invariably have failed. We now understand this thing better, and are guided in our operations by the brightest lights of science. On a proper occasion, I shall take the opportunity of publishing the results which have followed my operations in extreme cases of neuralgia.—Mc.]

§ Although I have already described this affection, I may add the following description of its symptoms, as given by Dr. Dawson. "The time and accession of the paroxysm, and the duration of it, are alike uncertain. A hearty meal or a copious drink of a stimulating fluid, will sometimes bring temporary relief. The pain is aggravated by walking, and slightly mitigated by reclining on the left side and applying pressure by the hand. In some cases the pain is always in the stomach only; but in others, it does, occasionally, for a short period, quit that organ, and, as it were, fancifully and indifferently affects the back, sides of the spine, or the integuments covering the sternum and ribs. The pain itself is of a peculiar and even of a varying nature. It is not acute, it is not lancinating, it is not spasmodic, it is neither sickening nor dragging. It is of an excruciating aching kind, and of the most soul-depressing nature. I have known a gentleman lie on the floor in agony, and have three distinct attacks, of three, four, or six hours, during twenty-four hours. Sometimes the stomach feels empty; at others it seems distended, and gives rise to bitter or saltish eructations. Yet the patient, even on the rack of pain, is not ill; and the instant the pain ceases he is as well as he could wish."

‖ Nosological Practice of Physic, p. 300.

a choice of evils; for him there is no middle path; he must either contentedly endure a pain which makes life a burden, and renders talents useless, or take opium; for where is the man, who, racked with pain in the stomach night and day, can perform his duties in society, and enjoy life as it ought to be enjoyed?" Unquestionably the effects of large doses of opium in this distressing malady are delightful for a time; but I am by no means disposed to regard this drug as the only means in our power for procuring relief in cases of this kind; I have myself suffered much from this complaint, and have taken opium in large doses; but I have found another remedy, which is less ruinous in its consequences, and far more permanent in its good effects than this narcotic. This remedy is the saturated tincture of *lobelia inflata*, a few tablespoonfuls of which have never failed to give me speedy relief, and to procure me long intervals of exemption from the disease. I have also used it in the case of a gentleman in this city with the happiest effect, but further than this my experience with this article does not go. The oxyde of bismuth, the carbonate of ammonia in conjunction with magnesia and mint water, the tincture of henbane, and the sulphate of quinine, with a diet consisting chiefly of animal food, have been recommended in this affection, and in some instances considerable benefit may no doubt be derived from them. I have prescribed the oxyde of zinc in a number of cases, and occasionally with advantage. Would not the use of the magnet, in the manner recommended by Laennec for the cure of angina pectoris, be beneficial in this complaint? I have just mentioned *animal food*, as, according to the experience of some, (Dr. Johnson,) most proper in cases of this kind. This may be correct with regard to some instances; but I have found it best to make as great a change of the customary diet of gastrodynic patients as could be done. Thus, if a person has been in the habit of using much animal food, he should be put upon a simple vegetable diet: and where the accustomed diet has been vegetable, which is most commonly the case, it should be changed to one consisting chiefly of animal substances. It has appeared to me that this affection is often connected or dependent on an ineffectual hemorrhoidal effort; and advantage might perhaps be obtained from leeches applied to the anus, and the internal use of small doses of aloes. I have been led to this conjecture by the case of a lady in this city, who, for six years, suffered from frequent extremely severe attacks of gastralgia, radiating along the muscles of the chest, into the left mamma. About a year ago, several large hemorrhoidal tumors appeared at the extremity of the rectum, and in a short time began to bleed freely. The discharge has recurred every three or four months, and she has not had an attack of the gastralgia since the hemorrhage first appeared.

Sect. II.—*Amaurosis.*

This disease consists in a diminution, or total loss of sight, from impaired or abolished sensibility of the retina to the impressions of light, or from decreased or lost power in the optic nerve to convey the visual impressions from the retina to the sensorium commune.

This impairment, or loss of sensorial function of the optic nerve, and its expansion, may depend either on organic disease of the retina, optic nerve, and thalamus, or merely on functional torpor, or palsy of these parts, without any perceptible structural lesion. Among the *organic affections* of the optic apparatus which give rise to this disease, the following are the principal. Extravasation of blood; opacity; structural lesion, and deposition of lymph upon the surface of the retina; fungous or other morbid growths; dropsy, and atrophy within the eye; and all such disorganizations as directly oppress or derange the texture of the retina; and, lastly, morbid conditions within the head, oppressing or disorganizing the optic nerve or its thalamus—as sanguineous or serous effusions, tu-

mors, suppurative destruction in the vicinity of the optic nerve or its origin, and thickening, atrophy, absorption, or ossification of its sheath.*

The causes which are capable of suspending or destroying the functional power of the retina and optic nerve, independent of perceptible organic change, are extremely various. Functional torpor of the optic apparatus may depend either on vascular turgescence of the retina of the sheath of the nerve, or of its thalamus, or on deficient arterial circulation in these parts; or, finally, it may be the result of an idiopathic paralysis, or loss of sensorial power of the retina and its nerve.

When the *organic* disorder that produces the amaurosis is seated in the eyeball itself, several, or all of the following phenomena accompany the disease:—namely, dilated pupil, its contracting power being feeble or null; congestion of the veins of the conjunctiva; a bluish-gray tint of the sclerotica; loss of regular shape of the globe of the eye, the sides either bulging out or appearing flattened; a turbidity or milkiness in the posterior chamber of the eye, "resembling the humors in the eye of the horse." In many instances of *organic* amaurosis, a small circular spot of a pearly or greenish-yellow color may be seen at the fundus of the eye, a small distance from the visual axis.† When the disease is the consequence of inflammation of the retina or choroid coat, and the inflammatory action has entirely subsided, we usually find the conjunctival veins varicose, the iris discolored, thick, very vascular, and inelastic; the bulk of the crystaline lens diminished, or liquefied and discolored, with opacity and deep yellow color of the vitreous humor. (Travers.) In such cases there is usually a feeling of tension, and, at times, of uneasiness, but rarely any distinct acute pains in the globe of the eye, and the sclerotica becomes thinner and semi-transparent, admitting the reflection of the vascular texture of the choroid coat which occasions the above-mentioned bluish-gray tint of the sclerotica. (Stevenson.) In some cases of organic amaurosis, an opaque white spot, or *projecting whitish* substance, may be seen on some part of the concave surface of the retina, when the eye is examined in a good light. This constitutes the medullary fungus of the retina, which, in the progress of the disease, involves the eye in one undistinguishable disorganized fungous mass.

Functional amaurosis, as has just been said, sometimes depends on vascular turgescence of the optic apparatus. In such cases the pupil is dilated, sluggish in its motion, or immovable; more or less strabismus, ptosis, or double vision of the affected eye, often exists; the carotids beat strongly; the face is apt to be flushed; a sense of fullness and tension in the globe of the eye is felt, with pain, and a feeling of pressure of the scalp; occasionally ringing in the ears; disorder and irritability of the stomach; and somnolency. Luminous sparks or flashes appear before the eyes, particularly on stooping, straining, or on first lying down. (Travers.) These cases sometimes come on suddenly. Mr. Stevenson has known several instances, in which the patients went to bed apparently well, and awoke with more or less complete loss of sight in one or both eyes.

Functional amaurosis from depletion occurs sometimes immediately after *excessive hemorrhages*, particularly uterine floodings. In this variety, as in that which arises from vascular congestion, the pupil is dilated and immovable, and there is usually deep-seated pain in the head, and occasional vertigo. This pain is attended with a feeling of circumscribed pressure on some part of the brain, accompanied sometimes with a jarring noise, "like that of a mill or threshing floor." In cases resulting from this cause, there exists, in fact, strong vascular congestion in the head; for there is no pathological fact better established than that strong determinations to the head often supervene as the immediate conse-

* Travers. Synopsis of the Diseases of the Eye, p. 141.

† "This appearance has been attributed to a circumscribed opacity of the retina, answering to the poros opticus. Others have supposed it to be the maculæ lutea of Sœmmerring. It is, however, with more propriety, ascribable to a diminished secretion of the black pigment."—*Stevenson on the Nature, Symptoms and Treatment of Amaurosis.*

quence of excessive sanguineous discharges.* It is of much importance to distinguish this from the former variety in a therapeutic point of view — for amaurosis from excessive sanguineous evacuations is always increased by even small abstractions of blood; whereas that which is attended with a plethoric state of the system, demands sanguineous evacuations.

Symptoms.—Functional amaurosis usually comes on very gradually. The patient at first complains of some weakness of sight. When he looks at small objects, as, for instance, the letters of a book, he finds that his vision is variable and irregular—the letters "being at one time more distinctly visible than at another, the sight of which he alternately loses or regains by shutting or rubbing his eyes, or by moving his head in different directions." Sometimes the approach of the disease is announced by a peculiar dimness of sight, as if a fine piece of gauze or spider's web were held before the eyes; at others, by the perception of spots, threads, or other imaginary appearances floating in the air a short distance from the face; and at a more advanced stage of the disease, colored spectra, or luminous impressions of objects remaining upon the retina, often occur. Sometimes the objects looked at appear to have a tremulous or wavering motion. Connected with these symptoms, there is generally more or less pain in the head and temples, diminishing in proportion as the dimness of vision increases, and ceasing altogether when the amaurosis is complete. When the pain continues severely, with but slight remissions, and is readily aggravated by whatever excites the system, we may presume that it is connected with *organic* disease within the brain; and such cases are almost invariably accompanied by torpor of the bowels; gastric derangement; disposition to lethargy; occasional confusion of mind; indisposition to corporeal or mental exertion; and paralysis in one or more of the muscles. In some cases, very severe spasmodic pains occasionally shoot through the eye into the head, coming on every night, or second night, about the same time, and continuing an hour or two, and are "accompanied with convulsive quivering of the muscles of the eye and eyelids, and profuse lachrymation."

Some patients affected with incomplete functional amaurosis, see more distinctly on first awaking in the morning; and in others, the sight is clearest in the evening. (Travers.) When one eye only is affected, the iris, in functional amaurosis, will generally act in accordance with that of the sound organ, "provided both be allowed to remain open at the same time; but if the latter be closed, the pupil of the diseased eye will be found to have lost its power of motion on the admission of the usual degrees of light."† In the majority of cases, the pupil is dilated and immovable; and frequently mis-shapen or irregular. It is sometimes smoky or clouded, or dark gray, or greenish gray, and occasionally of a reddish or yellowish-white appearance.

Diagnosis.—Immobility and dilatation of the pupil furnish no certain evidence of amaurosis. In some cases of complete amaurosis, though indeed very rarely, the pupil acts regularly; in others, it retains its ordinary size, but is motionless;‡ and in others, it is fixed and contracted.§ Moreover, the ciliary nerves may be paralyzed, occasioning enlargement and immobility of the pupil, without amaurosis.‖

* See the observations of Marshall Hall on this subject, in his "Medical Essays." The experiments of Dr. Seeds on the effects of excessive abstractions of blood in animals.—*Med.-Chirurg. Journ.*, No. vi. p. 107.

† Loc. cit., p. 68.

‡ Mr. Travers is of opinion, that, in cases of complete amaurosis where the pupil is of the natural shape, but motionless, the retina has, most probably, undergone some structural change.

§ When this is the case, says Mr. Stephenson, the disease is generally the result of inflammation of the internal ocular textures, and is usually attended "with an angular or irregular form of the pupillary border in one or more points of the circumference, and with an opacity of the capsule of the crystaline lens."

‖ [I have seen a case in which the solar rays, especially when concentrated by a lens, would dilate an amaurotic pupil to excess. The motions of the iris are sometimes wave-like or vibrating in cases where amaurosis is supervening. It is an excellent rule, which the author has quoted from Travers, to cover the eyes alternately while the condition of the pupil under the vicissitudes of light is examined.—Mc.]

Among the symptoms which may aid us in distinguishing amaurosis from *cataract*, writers particularly mention the different appearances which the flame of a candle presents to persons laboring under one or the other of these diseases. To a person affected with the latter disease, the flame of a candle appears as if it were surrounded with a uniform thin mist, or white semi-transparent cloud; to one laboring under the former affection, an iridescent halo seems to encircle the flame, or to emanate from the mist. In imperfect amaurosis, the faculty of vision is occasionally increased or diminished, "under different states of the circulation, as influenced by a full and stimulant meal, by which some find their sight improved, others greatly deteriorated. Enlivening or distressing mental emotions, and other physical causes, that have a tendency to excite or depress the energy of the nervous system, have a corresponding effect in affording temporary benefit, or in causing diminution of vision, *which does not occur in cases of incipient cataract.*"

Prognosis.—Those cases which depend on organic lesion, may be regarded as incurable; where, with total loss of sight, the iris is immovably dilated, or preternaturally contracted, accompanied with violent pain in the head, or eye, or cranium, when the disease occurs as a consequence of apoplexy, blows on the head or eye, syphilis, or protracted internal ophthalmia; and in cases where the above-mentioned whitish projection appears at the bottom of the eye, little or no hopes of a cure can be entertained.

Where, on the contrary, the amaurosis is not complete, and no severe and protracted pains in the head or eyes, or sense of constriction in the eyeball, accompanies the development of the disease; and where, at the same time, the pupil retains its natural shining black color, and some degree of sight still remains, there is reason to expect relief from remedial management. Periodical amaurosis, also, unless of very long standing, is of a favorable character; and, in general, all those instances of the disease which are purely functional, or symptomatic of visceral irritation, or metastasis of gout, rheumatism, &c., may be regarded as susceptible of being cured.

Causes.—When amaurosis is not the result of organic or structural disease of the optic apparatus, it arises, probably, in most instances, from *pressure* on some portion of the visual nervous texture. Even in those cases which occur in consequence of excessive losses of blood, vascular turgescence, and pressure of the retina, optic nerve, or its thalamus, is, perhaps, the immediate cause of the disease. I have already adverted to the great tendency to cephalic congestion in that exhausted state of the system which results from profuse hemorrhage, and in this state, vascular pressure of this structure may, it is to be presumed, readily occur. It may, nevertheless, in some instances, depend also on mere functional torpor, from previous over-excitation of the retina and optic nerve, or from the vitality of the nerve being too much depressed.*

It would appear, from the observations of pathologists, that persons who have dark-brown, blue, or black eyes, are, in general, much more liable to amaurotic affections than such as have light-colored, or gray eyes. It has been stated, that the proportion of instances of this disease in dark-eyed persons, is to that of the cases which occur in individuals with light, or gray eyes, as twenty-five to one.†

The *exciting causes* of amaurosis are very various. It may depend on *metastasis* of other affections, particularly of gout, and from the sudden suppression of habitual sanguineous or serous evacuations; as of the catamenial or hemorrhoidal discharges; the healing up of old ulcers; and the sudden retrocession of cutaneous eruptions; and of habitual perspiration of the feet.

It is sometimes *symptomatic* of hysterical, epileptic, hypochondriacal, and other nervous affections, (Beer;) arises from the excessive use of narcotics, as

* Weller. Manual of the Diseases of the Human Eye.

† Jahn's Klinik der Chronischen Krankh., bd. v., p. 295.

well as from the poisonous influence of lead; is the result of abdominal irritation, from a *loaded state of the bowels*;* suppressed, or deranged, or excessive secretions in the liver, kidneys or uterus; intestinal worms; and dyspeptic affections. Sudden mental emotions, particularly rage, terror, and protracted grief, sometimes produce this disease. The sudden suppression of the secretion of milk in the puerperal state has produced it; and it has arisen from rapid and copious salivation; from excessive venereal indulgence, particularly habitual self-pollution; from intoxication; and from the sudden influence of cold. Among the most common external causes of amaurosis, is intense application of the eye to the inspection of minute and bright objects†—which Mr. Stevenson thinks, tends to produce preternatural vascular turgescence in the retina and choroid coat. It may also be occasioned by falls or blows on the head; insolation; straining in parturition; evacuating the feces; or lifting—in short, by whatever is capable of causing preternatural sanguineous determination to the head. The occurrence of *symptomatic* amaurosis from excessive loss of blood, has already been mentioned. Mr. Travers and Dr. Hall‡ relate some remarkable examples of this kind.

Treatment.—When amaurosis arises from organic diseases of the visual organ, or the brain; or from epilepsy, or in consequence of violent forms of fever, and other acute constitutional diseases, nothing is to be expected from remedial treatment. The functional or symptomatic varieties of the disease, however, will often yield under a proper course of management.

The treatment of amaurosis must, of course, be modified according to the nature of the occasional cause; and the removal of the primary irritating cause ought to be the first object in prescribing for this disease. Mr. Travers remarks, that the treatment of amaurosis is almost entirely constitutional; and he attaches no value to the external application of stimulating vapors, lotions, ointments, and ethereal embrocations, &c., although setons, leeching and *blistering* are important auxiliaries. Under this point, however, Mr. Stevenson, as well as many others, differs widely from Mr. Travers. The former agrees with Mr. Ware in regarding *errhines* as often particularly useful in chronic functional amaurosis; and he thinks favorably of the use of stimulating applications to the eye, in cases unattended with fever, or local vascular irritation in the eye.

When the momentum of the circulation is preternaturally increased, and the eye is somewhat tender and irritable, and particularly when the habit is robust and plethoric, the treatment should be commenced by both general and local abstractions of blood. "Bleeding, in the early stage of *acute* amaurosis," says Dr. Stevenson, "is the sheet-anchor of our hopes. It should be repeated," he says, "at short intervals, until the violence of the symptoms shall have been moderated."

Immediate attention must also be paid to the bowels. So long as the general habit is phlogistic, *free purging* with calomel, succeeded by a portion of Epsom or Glauber's salts, should be practised every second or third day, and antimonials, in nauseating doses, administered during the intermediate time. In relation to the employment of sanguineous evacuations in this affection, Mr. Travers observes, that although obviously proper in cases attended with general plethora and cerebral compression, yet where the undue determination of blood to the eye is attended with diminished tone of the vessels of this organ—a circumstance

* Dr. Wishart has related an interesting case of amaurosis in the *Edinburgh Medical Journal* for July, 1825, which was manifestly the consequence of intestinal irritation from indurated fecal matter.

† "Hence the frequency of weakness of sight among the silk-stocking weavers, milliners, embroiderers, and other mechanics and artists whose occupations oblige them to exercise their visual organs with too little intermission and variety, in looking intently at their delicate, light-colored, and highly illuminated manipulations. Persons addicted to read, write, or perform much fine needlework, by the aid of candles, and what is much worse, by the brilliant and artificial light of lamps, rarely fail, if their organ of vision be constitutionally feeble, to discover, sooner or latter, the greater or less decay of sight."—*Stevenson*, loc. cit., p. 121.

‡ Researches, principally relative to the Morbid and Curative Effects of Loss of Blood, p. 71.

very common, he says, after deep-seated inflammation, or irritation and relaxation from over-excitement—depletion is always decidedly detrimental.

In cases of recent imperfect amaurosis making rapid progress, and attended with signs of obscure inflammation, the employment of mercury, so as speedily to produce soreness of the gums, *but not salivation*, will sometimes suddenly arrest the disease. Mr. Travers asserts that salivation does no good, and may readily prove hurtful. "When mercury is beneficial," he says, "its efficacy is perceived as soon as the mouth becomes sore." When the pupil shows a disposition to contract, or has actually formed adhesions with the capsule of the lens, the application of belladonna, or stramonium in solution, to the eyes, says Mr. Stevenson, "must on no account be omitted," in order to prevent permanent contraction and obliteration of the pupil.

The light should be excluded from the eyes where there are tenderness and irritability of the organ; and all kinds of compressing or tight bandages should be carefully avoided.

When the local and general excitement has been moderated, or where the disease from the beginning is free from manifest general vascular irritation, revulsive applications, particularly *blistering*, or a *seton* on the nape of the neck, and leeching at the temples and around the eyes, may be resorted to with advantage. In conjunction with the occasional employment of these external means, alterative and aperient remedies should be regularly used, until there is reason to think that the healthy condition of the visceral functions is restored. For this purpose, a great variety of remedies has been recommended, but the use of four or five grains of blue pill, with two grains of ipecacuanha at night, on going to bed, and a dose of rhubarb, or of the compound extract of colocynth, every second or third day, will probably do all that can be effected in this respect.* Benefit may also be derived, with this view, from the frequent use of very minute portions of tart. antimony, dissolved in an infusion of sarsaparilla or the root of burdock (*arctium lappa*). A grain of this antimonial may be dissolved in a pint of infusion, and drank in small portions throughout the day. If the visceral functions have been brought to a healthy state, and there is an entire absence of general and local vascular irritation, recourse should be had to tonic remedies, such as arsenic, bark, iron, and the mineral acids.

The eyes should be kept in a state of repose; and the patient be directed to take gentle exercise in the open air when the weather is dry, to use a nutritious but digestible diet, the cold bath, and regular rest.

When amaurosis is strictly chronic, or devoid of general or local irritated action, general depletion is not only useless, but frequently pernicious. Small abstractions of blood, however, by means of leeches, will sometimes be useful, by relieving the local congestion in the affected organ. In cases of this kind, much advantage may be derived from a seton in the back of the neck, or from the repeated application of blisters to that part. To lessen sanguineous congestion in the eye, some writers recommend the use of errhines, and there can be no doubt of their occasional beneficial influence, by the irritation they produce in the immediate vicinity of the affected organ, as well as the consequent increased discharge from the mucous membrane of the nose. Some advantage may also, at times, be derived, in cases of this kind, from stimulating applications directly to the eye; such as the *ungt. hydrarg. nitrat.*, the vapor of volatile

* Schmucker's visceral pills were formerly much employed in Germany for the cure of this disease. They are made according to the following formula: ℞.—G. Sagapen.—Galban.—Sapo. venet., āā ʒi; Pulv. rhæi ʒiss; Tart. emetic grs. xvi; Succ. glycyrrh. ʒi. Fiant. pill. singul. grs. v. Of these pills three are to be taken every morning and evening for a month. Richter recommends the following pills: ℞ —G. ammon.—Assafœtid.—Sapo. venet.—Rad. valerian.—Sumita arnicæ, āā ʒii; Tart. emetic grs. xviii. Fiant. pill. sing. grs. v. Six to be taken thrice daily for three or four weeks. The following combination forms an excellent purgative for this purpose: ℞.—Massæ hydr ʒi; G. aloes ʒss.; Tart. antim. gr. ii. Fiant. pill. No. xx. Take one every night on going to bed.

alkali; weak infusion of capsicum; vinous tincture of opium, &c. *Electricity* does not appear to possess any particular remedial powers in this affection; and it is said to be even frequently injurious. Mr. Travers has not seen a single instance of benefit derived from electricity.

Emetics were formerly much recommended in the treatment of amaurosis, not only for the purpose of evacuating the stomach, but also with a view to their general influence upon the nervous and sanguiferous systems. Mr. Travers does does not speak favorably of their effects in this disease. Richter, on the other hand, gives the most favorable account of their influence in amaurosis. That they have been employed with success in some instances, is unquestionable; and, under peculiar circumstances, may no doubt be again used with advantage; although they are certainly not so efficacious as they were formerly represented to be by physicians of high authority.

In complete amaurosis, of a chronic or asthenic character, the German writers recommend exposing the eye to a bright light, and even to the direct rays of a meridian sun, with a view of stimulating the palsied retina. Mr. Stevenson says, that he has heard of an instance of the success of this practice, although his own experience does not furnish him with an example of its usefulness. Mr. Stevenson recommends *dry cupping* applied to the ball of the eye and its appendages. "By carefully fixing a well adapted strong glass, fitted with an exhausting syringe upon the edges of the orbit, the instrument may be made capable of exerting a more or less powerful influence upon the organ of vision, in proportion to the extent to which the atmospheric air contained in the cupping-glass is exhausted. The effect of this application is to occasion a great redness and tumefaction of the eyelids; an immediate distension of the conjunctiva; and a bulging forward, or protrusion of the whole globe of the eye, the obvious tendency of which must be to relieve the deep-seated vessels." He mentions a few cases, in which this practice was employed with the most decided advantage.

Dr. Heathcote, of the Royal Infirmary of Edinburgh, has lately published some cases illustrative of the good effects of *strychnine* in amaurosis. The cases published by Dr. H., occurred in the practice of Dr. Short. The mode in which the strychnine was used in these cases, is as follows: A small blister, about the size of a crown piece, was applied upon the temple or forehead; when the part was vesicated, and the cuticle removed, *one-fourth* of a grain of *strychnia*, finely levigated, was dusted over the excoriated surface, and a piece of simple dressing placed over it. The quantity of strychnia applied is to be gradually increased, and the application made daily. Three cases, out of about sixteen, terminated successfully under this mode of management. In no instance did this remedy cause any injurious effects; although slight headache, giddiness and twitching of the limbs were experienced by some of the patients. "In one case, erysipelas of the face occurred, which immediately subsided upon the omission of the strychnia, and the use of opium, *which is its proper antidote.*" One patient, after about seven grains of the strychnia had been applied, was seized with a numbness and immobility of the lower extremities; but these effects soon gave way to a few doses of *opium* and aperient remedies. We find, also, a statement in the *London Medical Gazette*, of five cases treated on this plan in the Westminster Ophthalmic Infirmary. In one case, evident and considerable benefit ensued.*

Some modification in the treatment will, of course, always be made by the judicious practitioner, according to the occasional cause of the disease. Thus, when the disease appears to be the consequence of suppressed hemorrhoidal discharge, aloetic purgatives, stimulating enemata, and leeching round the anus, are indicated. If it be the result of an arthritic or rheumatic diathesis, advantage may probably be obtained from the internal use of the *tinctura guaiaci*, or colchicum, and sinapisms and blisters to the ankles. In instances that arise from

* Med. Chir. Rev., July 1830, p. 442.

syphilitic irritation, a slow mercurial course, with infusion of sarsaparilla, &c., will be particularly indicated, and the same remedies are to be relied on where manifest hepatic disorder is present. If suppressed perspiration lie at the bottom of the disease, the warm bath, diaphoretics, particularly antimonials, both in nauseating and emetic doses, will be appropriate means. In short, the practitioner should always endeavor to ascertain the cause of the disease, and to counteract or remove this cause, if possible, by an appropriate course of remedial management.*

CHAPTER IV.

CHRONIC AFFECTIONS OF THE RESPIRATORY ORGANS.

SECT. I.—*Asthma.*

ASTHMA is a paroxysmal affection of the respiratory organs, characterized by great difficulty of breathing, tightness across the breast, and a sense of impending suffocation, without fever or local inflammation.

In the majority of cases, certain symptoms, indicative of gastric derangement, precede, often for several days, the paroxysms of the disease. Among these symptoms, a sense of weight and fullness in the epigastrium, acid eructations, inappetency, or voraciousness, heartburn, flatulency, weight over the eyes, anxiety in the præcordia, and an itching of the skin, are the most common.

The paroxysm generally comes on at night, during sleep. The patient is seized with great anxiety, difficulty of breathing, and stricture across the breast, and a short dry cough. These symptoms soon acquire a most appalling degree of violence. The breathing becomes wheezing, extremely laborious, gasping, and suffocative, the countenance expressive of intense anxiety and distress, and the heart generally palpitates violently. The desire for fresh and free air is inexpressibly urgent; the patient insists on the doors and windows being thrown open; or he starts from his bed and rushes to the window for fresh air, and is wholly unable to remain in the recumbent posture. The extremities are generally cool, sometimes of the natural temperature, and moist; the face is bloated, and livid or pale, and the veins of the neck and head are turgid. The pulse is often irregular, intermitting, accelerated, moderately full, and compressible; sometimes it is nearly natural, and occasionally it is full, active, and firm. After these

* [This last sentence in the chapter on amaurosis imparts a valuable hint to some practitioners. There is no disease in which the treatment is conducted more empirically, or what is called systematically, than amaurosis. Accordingly there is not much greater success than in tetanus or even hydrophobia. The plan which I have always formed is founded on a careful study of the pathology of each particular case. When vascular engorgement attends an amaurotic condition, a long continuance in the use of local depletion and derivation will sometimes succeed. An over-distended cornea, in addition to diuretics and hydragogues, will often require punctures of the cornea to evacuate the humors. I succeeded in one case of total amaurosis attended by hydrophthalmia of the aqueous humor in the left, and of the vitreous in the right eye, by giving an active course of Clutterbuck's elaterium combined with calomel, and occasionally tapping the two over-distended humors in each eye. I cured an English gentleman of complete amaurosis in one eye, attended with syphilitic hemicrania and periosteal swellings of the scalp, by exciting a smart salivation, aided by the long-continued use of a vapor bath and diaphoretic decoctions. Dr. Beesley, of Texas, was restored to tolerable vision by the use of lunar caustic to blacken the integuments over the forehead and lid, and by the daily use of purgative doses of croton oil. In the case of a young lady, after removing a severe form of attendant spinal irritation, and reducing the size of her over-distended eyeballs by the use of elaterium, I restored perfect vision by the use of electro-magnetic apparatus.—Mc.]

symptoms have continued for an uncertain time, the breathing gradually becomes less laborious and anxious, and towards morning a copious expectoration of viscid mucus very generally ensues, which always brings with it considerable relief. During the ensuing day the patient usually experiences but little uneasiness or oppression in the chest. On the next night, however, the paroxysm of suffocative respiration returns; and in this way the disease proceeds, with remissions by day, and violent exacerbations at night, for three or four days in succession, and in some instances much longer, before it finally subsides.

During the paroxysm the urine is almost always pale and copious, and the abdomen distended with flatus. Breer states that the temperature of the body is generally considerably below the healthy standard. He has found the thermometer, placed under the tongue, as low as 82° during the asthmatic fit. He observes, also, that the violence and inconvenience of the paroxysm are equal, whether the stomach be full or empty; but that great distress is experienced immediately *after* the fit, if the stomach be completely empty. Patients often experience a sensation in the abdomen, about the commencement of the paroxysm, as if an evacuation from the bowels would certainly greatly relieve them; but this feeling is almost invariably deceptive. No distinct pain is felt in the chest during the asthmatic paroxysm.

Causes.—Asthma rarely occurs before the age of puberty; yet Dr. Gregory states that "the period of *youth* and manhood is most prone to it." If, indeed, we include the *acute asthma of Millar*, or as it is more commonly called in this country, *spasmodic croup*, under the head of genuine asthmatic affections, as is done by most of the German writers, there can be no doubt of the correctness of this observation; but the spasmodic croup of children and the true asthma of adults are manifestly very distinct diseases. It is generally admitted that a predisposition to this affection is sometimes hereditary. This predisposition would seem to consist in a peculiarly irritable state of the pulmonary system; or more correctly, perhaps, of the pneumogastric nerve. That this nerve is the seat of that peculiar condition which predisposes to asthma seems probable from the circumstance that, in persons who are subject to this disease, almost all the organs to which this nerve is largely distributed are particularly liable, from slight causes, to functional derangement. Thus, there are few asthmatic subjects who are not especially liable to gastric disorders; as indigestion, flatulent colic, and gastralgic affections. These facts would appear to show that the pneumogastric nerve which presides over the functions of the stomach and lungs is in a state peculiarly susceptible of being thrown into morbid excitement in asthmatic individuals, and that this condition has probably an important share in the predisposition in question.

Authors have divided asthma into various species, founded principally on the different characters of the exciting or proximate causes of the disease. Bree has subdivided the disease into four varieties, namely: 1, those cases that are excited by the irritation of effused serum in the lungs; 2, those arising from a gaseous acrimony in the pulmonary cells; 3, those resulting from gastric or abdominal irritation; and 4, those depending on habit. This division is, however, altogether arbitrary, as it is manifestly founded on gratuitous principles; for its dependence on an *aerial acrimony* in the lungs is a mere hypothesis; and the effused serum in the lungs is an effect, probably, and not the cause of the asthmatic paroxysm. It is certain, at least, that the difficulty of breathing always commences and continues for some time before the effusion of mucus into the bronchial cells becomes copious. Richter describes no less than eleven species of asthma, founded on the character of its prominent exciting causes, namely: *Asthma hypochondricum et hystericum; A. plethoricum; A. urinosum; A. aereum; A. abdominale; A. nocturnum incubus; A. metallicum; A. à causa specifica; A. ex debilitate; A. spasmodicum;* and *A. acutum periodicum millari.*

Some writers assume only three varieties:—the *spasmodic*, the *dry*, and the

asthma from abdominal irritation. Dr. Good has admitted of but two species, namely: the *dry* or nervous, and the *humid* asthma.

Such divisions do not, however, appear to possess any essential *practical* usefulness; and the mere *dryness* or *humidity* of the cough cannot, I think, be regarded as of sufficient importance to form the basis of a *pathological* distinction. As symptoms, they unquestionably deserve attention; and it is no less proper, in a practical point of view, to attend to the nature of the *exciting causes*. The judicious and careful physician will not, however, require the aid of classification and subdivisions to bring these circumstances to his attention; and it may be reasonably doubted whether any distinctions not founded on prominent and essential points of difference can be usefully admitted into the description and pathology of diseases.

The exciting causes of asthma are—

1. *Particular conditions of the atmosphere, in relation to its dryness or humidity, electricity, and temperature.* In general, asthmatic individuals breathe easiest in a pure and unconfined air; but there are many who breathe better in the impure atmosphere of populous cities or crowded rooms than in the fresh and uncontaminated air of the country. Most persons subject to asthma, bear a dry and warm air much better than a cold and humid atmosphere; but here, too, the very reverse sometimes obtains in certain individuals liable to this affection. Some suffer most from this disease during the warm weather of summer; whilst others experience its attacks only in the winter, or about the autumnal and vernal equinoxes.

2. *Various irritating matters inhaled into the lungs* are capable of exciting the disease in persons predisposed to it; such as dust, and the fumes of lead, arsenic, sulphur, nitric acid, tobacco, and other irritating and offensive vapors.

3. *Gastro-intestinal irritation*, from indigestible and irritating articles of food, vitiated secretions, or a loaded state of the bowels, is one of the most common exciting causes of the asthmatic paroxysm. Almost all asthmatic subjects are peculiarly liable to gastric disorders from causes of this kind, and even slight irregularities in diet are apt to give rise to oppressed breathing in individuals of this habit.

4. *The suppression of habitual sanguineous and serous discharges* frequently gives rise to this affection. I have, during the last eight years, occasionally attended an old gentleman, in whom the temporary drying up of a long-standing superficial ulcer on the left leg has invariably been followed by violent paroxysms of asthma. I have seen an instance in which very distressing asthmatic symptoms alternated with the hemorrhoidal discharge. The suppression of the menses sometimes gives rise to nervous or *hysterical* asthma.

5. *Metastasis* of rheumatism and *gout*, and of various cutaneous affections, sometimes gives rise to more or less violent asthmatic symptoms. One of my patients, a rheumatic subject, has had several violent fits of asthma during the remission of his arthritic affections. M. Andral mentions an extremely violent case, which was produced by the sudden disappearance of a dartrous eruption. Leeches and blisters were applied to the part where the eruption had disappeared; and the asthma, by this measure, was completely removed in a few days.*

6. *General plethora*, in co-operation with causes that produce strong sanguineous determinations to the lungs, or increase the momentum of the circulation, is particularly favorable to the occurrence of asthma. Individuals of obese and robust habits, florid and full complexions, with large and turgid veins about the neck and head, are especially liable to asthmatic symptoms from over-exertion by exercise, loud speaking, singing, or violent mental emotions.

7. *Cold*, when the body is in a state of free perspiration, and particularly suppressed perspiration of the feet, may excite the disease. I attended a lady about

* Med.-Chir. Rev., vol. vi. p. 447.

ten years ago, who suffered exceedingly from a protracted and regular paroxysm of asthma, which was brought on by bathing her feet in very cold water. She was subject to profuse sweating of the feet.

8. *Mental emotions*, particularly violent anger and terror, will sometimes excite asthma in those who are predisposed to it.

9. *Particular odors and articles of diet, from peculiarity of habit, or idiosyncrasy*, may give rise to asthmatic affections in certain individuals. Thus the odor of *ipecacuanha* has excited the disease in some persons; and instances are mentioned in which asthmatic paroxysms have been caused by the odor of musk, roses, red beets, fresh hay, and sealing-wax. (Parry.)

10. But by far the most common exciting cause of asthmatic *symptoms* is organic affection of the heart and aorta. Ossification of the cardiac valves, hypertrophy, aneurism of the large arterial trunks within the chest, and other organic causes that disturb the action of the heart, are rarely wholly free from symptoms of asthma. It is, generally, in cases of this kind, that we find the disease to alternate with œdema of the extremities, both being merely symptomatic of the cardiac affection.

11. Finally, asthma, like all other paroxysmal, nervous, and spasmodic affections, may continue to recur under the influence of what Dr. Darwin calls association, or that tendency in the animal economy to repeat morbid actions, when once established in the system, without the renewed application of the original exciting cause.

Pathology.—Various and very discrepant opinions have been expressed with regard to the pathology or proximate cause of asthma. Of late years, several French writers* have denied, or, at least, greatly doubted the possibility of asthma, independent of organic disease within the cavity of the chest. There can be no doubt, indeed, that the majority of cases usually called asthmatic affections arise from causes of this kind, more especially from organic cardiac diseases, aneurism of the large arterial trunks, and pulmonary hepatization. The occurrence of purely spasmodic asthma, wholly independent of obvious structural disorder, is, nevertheless, equally unquestionable.

In relation to the immediate cause of the dyspnœa in spasmodic asthma, there are two doctrines which at present divide the sentiments of pathologists. According to some, the suffocative breathing is caused by a *spasmodic* constriction of the air-cells and smaller bronchial tubes, in consequence of which the free admission of air into the lungs is greatly impeded. Others believe that the oppressed respiration depends on vascular engorgement of the mucous membrane of the bronchia, giving rise, by the tumefaction of this membrane, to a mechanical diminution of the bronchial tubes and cells, and consequent obstruction to the regular intromission of air to the lungs. Laennec, among many others, has adopted the former opinion, and has endeavored to prove that the bronchial ramifications are furnished with a coat of circular fibres, beginning where the cartilaginous circles terminate. By the spasmodic contraction of these fibres, the air-passages are obstructed, and the phenomena of asthma produced. He asserts, that he has "met with many cases in which it was impossible, after the most minute examination, to find any organic lesion whatever to which the asthma could be attributed. I am convinced," he says, "that the asthmatic paroxysm may be induced equally by the supervention of a fresh catarrh, and by a deranged state of the nervous influence, occasioning pulmonary spasm, or an increase of the necessity of respiration, and sometimes by both causes at once. With the exception of the different kinds of catarrh, the occasional causes of asthma and dyspnœa are almost always of a kind to give occasion to an immediate and evident disturbance of the nervous influence. Of this kind are strong mental emotion; venereal excesses; the influence of light and darkness; retrocession of gout (a disease which, from its mobility and various effects, can only be

* Rostan.

considered a nervous affection); certain odors, such as those of the tuberose, heliotrope, stored apples, &c.; changes of atmospheric air, electricity, and other less appreciable conditions of the atmosphere."*

Mr. Abernethy appears to entertain a similar view of the nature of asthma. He contends, that one of the principal causes of this disease is a morbid irritability of the mucous membrane of the air-cells. "A man," he observes "having irritable lungs, may be sitting comfortably enough at the fire-side, but a little smoke comes into the room, and he can breathe no more; he gasps for breath; he cannot enlarge the chest, and he finds the utmost difficulty in respiring; but where is the difficulty? Where is the sensation of pain and contraction? Why, in the lungs themselves; the hinderance is there; I believe it is all irritability, and which proceeds from the state of the stomach."† Other writers of eminence have declared it as their opinion, that pure spasmodic asthma depends immediately on a constriction of the air-cells and smaller bronchial ramifications, by which the ingress of atmospheric air is impeded or prevented, and suffocative respiration produced. It has been objected to this doctrine, that we have no evidence of the existence of muscular fibres in the smaller branches of bronchia and air-cells; but M. Laennec observes that as such fibres do undoubtedly exist in the larger bronchial tubes, analogy must lead us to admit their existence in the ultimate ramifications. "Besides, it is by no means demonstrated," he says, "that muscular fibre is the only contractible tissue; indeed, the contrary is proved by the fact, that animals of almost a mucilaginous consistence are capable of evident contraction."‡

We are not, however, without direct evidence of the existence of contractile fibres in the minuter bronchial tubes. Professor Nasse, of Halle, has published some very interesting experiments on pulmonary contraction.§ He asserts that in the lungs of sheep, he was able, with a good lens, to trace the longitudinal fibres of the internal surface of the bronchia, described by Sœmmerring and Reiseisen,‖ into the smallest bronchial ramifications; and by means of the galvanic influence, he demonstrated the contraction of these fibres in the most unequivocal manner. Morgagni has very particularly noticed the fibres of the bronchia;¶ and although their *apparent* tendinous character would seem to oppose the idea of their possessing contractility, yet we perceive that the contractile fibres of the bladder and uterus possess a somewhat analogous appearance and structure. From the experiments of Nasse, it appears that the bronchial fibres possess considerable contractility; that by passing the galvanic influence through the pneumogastric nerves, these fibres and consequently the whole lungs, are thrown into a state of contraction; and finally, that by dividing the par vaga, the power of pulmonary or bronchial contraction is destroyed, and dyspnœa produced.

It is highly probable, therefore, that asthma consists essentially in a peculiar irritation of the pneumogastric nerves, in consequence of which the smaller bronchial tubes and air-cells are thrown into a state of spasmodic constriction, by which the regular ingress of air to the lungs is prevented. When we advert to the almost invariable antecedent and concomitant manifestations of functional disorder of the stomach in this affection, we have good reason to conclude that the nerves which especially preside over the functions of this organ and the lungs, are in a state of irritation or morbid excitement. The suddenness with

* On the Diseases of the Chest, last edition, p. 414.

† Lectures, p. 375.

‡ Loc. cit., p. 408.

§ Undersuchungen über die naechste ursache des hustens. Leipzig, 1829, p. 9.

‖ Ueber den Bau der Lungen.

¶ Extant in tunica intima ceu lacerti quidam insignes ex albicantibus fibrillis compacti. Hi digitos aliquot supra asperiæ arteriæ divisionem nitium capiunt, et secundum ejus longitudinem dispositi, interstitium illud, quod memorabam, tenentes, ubi ad secundum bronchiorum divisionem pervenerunt; ibi primum solent per omnem undique bronchiorum superficiem ad istorem extrema versus decurrere. Quorum lacertorum usus nunc non existimo.—*Adversaria Anatom. Adver.*, i. § 25.

which the asthmatic paroxysm is sometimes excited by mental emotions and other causes that act directly through the nervous system, and above all, the rapidity with which it is often dissipated by a few full doses of the *lobelia inflata*, are directly and strongly confirmatory of this view of the pathology of the disease. The existence of a constricted state of the ultimate branches of the bronchia, dependent, we may presume, on the functional derangement or irritation of the pneumogastric nerves, appears, moreover, to be confirmed by the good effects which, according to Dr. Chiarenti, result from the artificial insufflation of atmospheric air into the lungs in this affection.*

Dr. Parry, however, considers this opinion of the nature of asthma as being without the least foundation, and ascribes the dyspnœa to great vascular turgescence of the bronchial mucous membrane, by which the smaller respiratory passages are mechanically diminished or closed, until the vessels relieve themselves by a copious effusion of serum. If, however, vascular congestion be the only or principal morbid condition upon which the peculiar symptoms of the disease depend, it seems extremely improbable that any impressions made on the stomach would be capable of speedily arresting the progress of the disease; and yet, in a considerable number of instances, I have known violent paroxysms of asthma greatly, and in one case completely allayed, in less than thirty minutes, by the use of the *lobelia*. There can be no doubt that congestion always takes place to a greater or less extent in the vessels of the bronchia and air-cells, after the development of the paroxysm; but if this congestion were as great as Dr. Parry and others seem to think, is it not very likely that effusions of blood would occasionally show themselves in the expectoration? The mere circumstance of the frequent inordinate secretion of mucus into the bronchia is no satisfactory evidence that great sanguineous congestion pre-existed in the mucous membrane of the lungs. It is well known that the process of secretion is wholly under the influence of the nerves, and we do no violence to correct physiological data, in presuming that the redundant secretion of mucus is determined by the irritation of the pneumogastric nerves.

Prognosis.—An attack of spasmodic asthma seldom proves fatal; and although the frequent recurrence of the disease is apt ultimately to give rise to dangerous pulmonary congestions, effusions within the chest, and to general exhaustion, it is by no means uncommon to meet with persons of very advanced age who have been long subject to this disease.

Where asthmatic symptoms are connected with, or symptomatic of, organic pulmonary or cardiac disorder, the prognosis is of course always peculiarly unfavorable; for in such cases, fatal dropsical effusion into the cavity of the pleura or the pericardium is almost a never-failing consequence of the disease. Spasmodic asthma resulting from mental emotions, or some peculiar odor or vapor, is, in general, less obstinate and protracted than those cases that arise from gastric irritation, or recur from the influence of habit.

Treatment.—The treatment of asthma is either merely palliative, or radical, according as we prescribe for the mitigation and removal of the paroxysm, or the prevention of its subsequent recurrence during the intervals of the fits. A great number of remedies and modes of treatment have been recommended for palliating or allaying the asthmatic paroxysm; but the effects of remedies of this kind are extremely variable in different cases. Some will do much good in one person, and fail altogether of procuring relief in an apparently similar case in another individual. Nay, the same remedy will in one attack afford speedy relief, and fail entirely in another paroxysm in the same person. (Laennec.)

According to the pathology advocated above, the principal indications of cure during the paroxysm are to diminish the pulmonary congestion, and especially to relax the spasm of the bronchial tubes and air-cells. Where the pulse is active, and the countenance livid, in young and vigorous subjects, blood should be freely

* Journal de Progress. Vide Med.-Chir. Rev., Jan. 1828.

drawn; for although venesection will rarely by itself make any decisive or permanent impression on the paroxysm, its employment is always proper in robust and sanguineous habits, to obviate any evil consequences that might result from the violent pulmonary and cardiac congestion, and as a preparatory measure to the employment of other remedies. Professor Potter, of Baltimore, expresses much confidence in the efficacy of blood-letting in asthma—more than seems to be warranted by general experience. He considers bleeding "not only the most effectual remedy" in strong subjects, but in many instances capable of effecting a radical cure.* Laennec observes that "we must never omit blood-letting, whenever the lividity of the countenance, the strength of the patient's constitution, or the over-action of the heart, indicates pulmonary congestion; *but we must be careful not to abuse this practice*, which, in general, only produces a temporary advantage." In old persons who have suffered much from the disease, it is not, in general, prudent to abstract blood. It must be observed, however, that many writers regard this measure as always of very doubtful propriety and often injurious in its effects. Judging from my own experience, I am not inclined to place much reliance on its palliative effects, although, for the reasons stated above, I have very generally resorted to it, in robust and full habits, without having ever known any ill consequences to result from its employment.

The *narcotics* have been a good deal employed with the view of allaying the asthmatic paroxysm. Laennec has found opium and colchicum the most powerful remedies for mitigating and curtailing the paroxysm. Articles of this kind, he says, may act beneficially, both by lessening the necessity of respiration, and by relaxing the pulmonary spasm. Hyoscyamus and stramonium, also, may be used with occasional advantage. The latter article, in particular, has done much good in several instances of *habitual* asthma, under my own observation. In one case, a quarter of a grain of the extract given every four hours for two days, suspended the disease entirely for upwards of nine months. The leaves and roots of this plant, smoked in a pipe, will sometimes give much ease to habitual asthmatics; and it is said, that when used in this way, it will sometimes promptly mitigate the paroxysms of the complaint. I have prescribed it in a few instances in this manner, but never with any particular advantage; and writers have mentioned instances in which it proved injurious.†

In cases attended with catarrhal irritation, and a very copious secretion of viscid mucus into the bronchia, *emetics* sometimes procure considerable relief. The production of emesis is particularly proper, where the paroxysm comes on soon after taking a full meal. It is not necessary, nor, in general proper, to excite strong vomiting. Dr. Akenside asserts that he has derived as much benefit from nauseating doses of ipecacuanha in this affection, as from full emesis. It is generally admitted that *ipecacuanha* is decidedly the best article for this purpose. It is said that the union of distilled vinegar and ipecacuanha forms a particularly useful remedy in this disease. Three grains of the latter with three drachms of the former may be taken every fifteen minutes, until nausea or gentle vomiting is excited.

The vinegar of *squills*, too, has been highly extolled in asthmatic affections, both for its emetic and expectorant powers. Sir John Floyer considered this preparation as a specific in asthma. He asserts, that he has often prevented the paroxysm, by taking a dose of it at bed-time. Dr. Bree, also, places much reliance on the powers of this remedy; and he observes that its efficacy is in proportion to its emetic operation. I have known much relief obtained from this remedy, taken in two drachm doses every half hour until nausea was induced; more frequently, however, no obvious advantage resulted from its use.

Vinegar is much praised by Bree as palliative in the paroxysm of spasmodic

* Gregory's Practice, vol. i. p. 187, second edition.

† [In France much use is made of the different preparations of belladonna. Both the extract and the tincture, especially of the root of the plant, are combined with antispasmodics and tonics in the treatment of asthma.—Mc.]

asthma. He found it more frequently and decidedly beneficial, he says, than any other remedy he had tried. One of my patients, affected with occasional paroxysms of this disease, has in several attacks derived great relief from two or three tablespoonfuls of strong vinegar taken at intervals of half an hour, and from inhaling its fumes. In the last two attacks, however, he derived no benefit from its employment.

Bree speaks very favorably, also, of the union of acids and narcotics as palliatives in the asthmatic paroxysm. He recommends the following formula as an excellent combination of this kind.*

In the asthma of old people, attended with deficient urinary secretion, and œdema of the feet, *diuretics* sometimes answer an excellent purpose. It is in cases of this kind especially that the squill may be used with benefit. In general, a good deal of advantage may be derived from diuretics in *habitual* asthmatic affections. Dr. Ferriar speaks well of the powers of digitalis combined with small doses of opium in such cases; and Dr. Percival asserts that he has known this combination to produce very favorable effects. A copious flow of urine is always a favorable symptom in this affection.

Some writers (Pringle, Percival) speak favorably of the use of strong coffee in this affection. I have met with a few individuals who derived advantage from its use during the paroxysm. In another person, however, subject to habitual difficulty of breathing with occasional violent fits of dyspnœa, the use of coffee has, of late years, invariably aggravated the difficulty of respiration.

Expectorants may occasionally be employed with some benefit in this disease; and for this purpose, the different preparations of the squill appear to be the best remedy. I have known the following mixture to give much relief towards the termination of an asthmatic paroxysm.†

Antispasmodics do not often produce any good effects; yet in slight cases, considerable relief may be obtained from inhaling the vapor of ether; and in old and habitual cases, the aqueous solution of assafœtida has afforded temporary benefit. The only article of this kind which I have found to manifest any particular powers, in allaying the violence of the asthmatic paroxysms, is the root of the skunk cabbage, (*symplocarpus fœtida.*) I have occasionally employed this article in attacks of spasmodic asthma, and in several instances, with much temporary benefit. From thirty to fifty grains of the powdered root may be taken every two or three hours during the paroxysms, according to the urgency and obstinacy of the symptoms.

Of all the remedies we possess, however, the *lobelia inflata* is, I think, decidedly the most valuable in this affection. Within the last five years, I have had an opportunity of witnessing its good effects in four cases, and I can truly say, that in two of these it acted like a charm. I have known the most violent paroxysms of spasmodic asthma completely subdued in less than thirty minutes by this medicine. It appears to me that ergot does not more certainly act upon the gravid uterus during parturition, than the lobelia upon the pulmonary organs in asthma. I have even found it to mitigate the dyspnœa which occurs in consequence of organic affections of the heart. Since the publication of the first edition of this work, I have had occasion to prescribe this article in a violent and inveterate case of this malady. The good effects, in this instance, were as prompt and decisive as in any case I had previously witnessed. In one hour after the exhibition of the remedy, the patient's respiration was entirely free from difficulty or oppression.

* ℞.—Tinct. scill. gtt. x.
Acid. nitric. gr. vi.
Extract. hyoscyam. gr. iii.
Aquæ fontanæ ℥iss.—M. This draught is to be repeated thrice daily.

† ℞.—G. Ammoniac. ℥i. solve in
Acid. scillæ ℥iss.
Tinct. opii camp. ℥ss.—M. Take a teaspoonful every hour, in a little clear and strong coffee.

The good effects of a full dose of this medicine are often experienced in the course of ten or fifteen minutes after it is taken. The Rev. Dr. Cuttler, in a violent paroxysm of spasmodic asthma, took a tablespoonful of the saturated tincture. "In three or four minutes," he says, "my breathing was free as it ever was. In ten minutes I took another spoonful, which occasioned sickness. After ten minutes I took the third, which produced sensible effects on the stomach, and moderate puking, with a kind of prickly sensation through the whole system, even to the extremities of the fingers and toes. Since that time I have enjoyed as good health as perhaps before the first attack."* In a case of spasmodic asthma, in which I employed this tincture, during the present summer, the dyspnœa was almost entirely allayed in fifteen minutes after the first dose was taken. I have not found it necessary to give it to the extent of producing emesis, though some evidence of its influence on the stomach, as nausea, is desirable. A tablespoonful of the saturated tincture may be given every ten or fifteen minutes. Within the last two years I have relieved two cases of long standing asthma by ordering a large teaspoonful of the tincture of lobelia to be taken upon the first approach of the paroxysm, and continued every ten minutes until nausea was occasioned. With the nausea the paroxysm immediately subsided.

A great variety of other remedies have been employed with more or less advantage in asthma. The prussic acid was successfully given by Dr. Oliver and Dr. Granville. *Alkalies*, particularly the carbonate of potash, will be proper where there is reason to suspect acidity of the stomach. Dr. Bree strongly recommends the use of prepared chalk and rhubarb in combination, in cases of this kind—more especially after the operation of a gentle emetic. The use of laxatives, with some absorbent, will, in general, afford some advantage in habitual cases, attended with dyspeptic symptoms, and torpor of the bowels.

Tonics, also, are said occasionally to produce very good effects in protracted cases, attended with much debility and general relaxation. The bark is especially recommended by Sir John Floyer. During the intervals of the paroxysms, much benefit may, no doubt, be derived from this tonic, in individuals of exhausted and relaxed habits, but there are few physicians, I presume, who would venture on the exhibition of this remedy during the paroxysm, except under circumstances especially indicating its employment.

Dr. Chiarenti, an Italian physician, has lately published a statement, from which it appears, that the artificial insufflation of atmospheric air, by means of a common bellows, is capable of speedily removing the asthmatic paroxysm. "He introduced the pipe of the bellows into his mouth, (he was himself affected with the disease,) and closing the nostrils, he pushed the air forcibly into his lungs, and with instant relief." He afterwards tried the same means in other cases of this disease, and always with the same happy result.†

Galvanism has, of late years, been employed with advantage in chronic asthmatic affections, by Dr. Philip and others. The galvanic influence must not, however, be communicated with much force. The two wires of a weak trough are to be attached, one to a piece of metal placed on the pit of the stomach, and the other on the side of the neck, over the *par vagum*.

With the view of preventing the recurrence of the asthmatic paroxysms, recourse must be had to tonics, a regulated diet, a change of air or climate, and regular exercise; and the usual exciting causes of the disease must be carefully avoided. The tonics usually employed are bark, quina, arsenic, and the carbonate of iron. Laennec states, that he has derived much advantage from the latter article, during the intermissions of the disease. Whilst tonics are employed, attention must also be paid to the state of the bowels, and the hepatic functions. An occasional blue pill at night, followed by a gentle aperient in the morning, the use of the tepid shower-bath, where the system is relaxed or exhausted, or cold bathing in robust and full habits, together with regular exercise out of doors,

* Thacher's Dispensatory.

† Med.-Chir. Rev., January 1828, p. 221.

change of air or climate,* agreeable occupation of the mind, a light and simple diet, and the careful avoidance of the usual exciting causes of the disease, are the most effectual measures for preventing, or postponing and moderating the violence of the attacks. Attention must, of course, be paid to the character of the exciting cause in prescribing for asthma, both with a view to its palliation and radical cure. When the disease is attended with a rheumatic or gouty diathesis, colchicum, diuretics and opium are especially indicated. When it succeeds the healing up of an old discharging ulcer, blisters and sinapisms to the part are proper. Andral succeeded in curing a violent case by means of this kind. Here diuretics, also, are generally peculiarly beneficial. Where catarrhal irritation has excited the disease, emetics, the warm bath, squills, and opiates, may be resorted to with a good prospect of success; and in cases that depend on gastric irritation, alteratives, the warm bath, mild aperients, tonics, and regular exercise, are particularly proper. "Among the remedies best deserving notice in asthma," says Laennec, "I would mention a mild and spare diet, residence in a more temperate climate, and warm bathing. The first of these measures will be found very beneficial in cases complicated with gastric irritation; the two last are especially indicated in that class of cases which date from the disappearance of cutaneous eruptions, under the use of powerful external applications."†

Sect. II.—*Whooping-Cough.*

This is unquestionably one of the most remarkable diseases with which we are acquainted. A cough, which is highly contagious in its nature—which has its regular rise, progress and declension—and which completely destroys the susceptibility of the system to a subsequent or second invasion of the disease, is a phenomenon truly mysterious and striking.

It is maintained by some writers, that whooping-cough is comparatively a modern disease; and some assert that it was first brought into Europe out of Africa, in the thirteenth century. By consulting the works of the ancients, however, it would seem that this disease was known at a very early period of our science. Hippocrates, in the 6th book on Epidemics, and also in the 6th section of his Aphorisms, speaks of a cough, which, from a short description he gives of it, may, I think, be regarded as the same affection which is now known under the name of whooping-cough. The first distinct and comprehensive description of this malady, however, was given by Mezeray, in the year 1414, in his Chronological History of France. Since that time, a great many epidemics of this disease have been circumstantially recorded; and medical literature furnishes us with no inconsiderable number of elaborate monographs on its nature and treatment.

Whooping-cough usually commences with the symptoms of ordinary catarrh. The patient at first experiences some degree of lassitude, headache and sneezing, with a slight hoarseness, and occasional oppression of breathing. The sleep is generally disturbed by dreams and sudden starts; the appetite becomes weak, the bowels torpid, and the pulse slightly febrile towards evening. For the first two or three weeks the cough is almost always dry and ringing; and the paroxysms are short, and free from that peculiar sound which is called whooping. At the end of this time the disease begins to assume more of a convulsive or spasmodic

* [It is astonishing to witness the effects of a change of air in many cases. One of my patients could never sleep out of town without being seized with a paroxysm of asthma; while in the city, he was always in a great measure free from the disease. One of my relatives could never visit Philadelphia without an attack. Some patients are always worse in the upper stories of a house; and one old gentleman was sure to be attacked if he got up as high as the third story chamber in either of our cities. Such facts should always be looked after in the selection of a suitable residence for every individual afflicted with this distressing complaint.—Mc.]

† Loc. cit., p. 419.

character, so far, at least, as the mere cough is concerned. The paroxysms of coughing now come on more frequently, and are of longer duration than previously. The inspirations during the fits of coughing are extremely difficult, slow, and stridulous, and attended with a sense of obstruction or spasmodic stricture of the glottis, rendering the paroxysms distressingly suffocative, and, in a manner, convulsive.

The approach of a fit of coughing is generally announced by a peculiar sensation of tightness in the breast, and of titillation in the larynx and præcordia. These circumstances should be borne in mind, for they throw considerable light on the pathology of this remarkable affection. The duration of the fits of coughing is very various. In some instances, the paroxysms are generally over in less than half a minute; in others, they last from five to six minutes, and often longer. The spell of coughing at this stage of the disease, is always terminated by the discharge of a large quantity of viscid mucus; and the patient frequently experiences some pain in the chest immediately after the cough has subsided. In many cases, the cough continues until vomiting comes on, when it is immediately arrested, and the patient is greatly relieved. So violent, in some instances, is the fit of coughing, that it induces a state of partial insensibility, and a most distressing sense of impending suffocation. Occasionally, the determination of blood to the head is so great, during the paroxysm of coughing, that it bursts out from the nose and mouth; and it is not uncommon for children to become convulsed, in consequence of the cerebral compression from this cause. In this aggravated state, the disease usually continues from four to six weeks, before it begins to abate. The declension is always very gradual, continuing commonly from two to four weeks. Fever is not essentially connected with the disease, although in many instances there is a manifest febrile irritation present during some period of the complaint.

Whooping-cough occurs almost exclusively during childhood. I have nevertheless met with two instances of the disease in subjects beyond the fiftieth year of age, and several in persons beyond the thirtieth and fortieth year. It is highly contagious, and occurs almost universally in an epidemic form. I have never yet met with a sporadic case of this affection, although it cannot be doubted that such instances do occasionally occur. It would seem as if there existed some latent connection between the contagions of whooping-cough and measles; for the former frequently prevails most extensively, either immediately previous, or in alternation, or directly after the occurrence of epidemic measles.* Spring and autumn appear to be most favorable to the occurrence of whooping-cough, and it is during the wet and variable periods of these seasons that the disease is most liable to become dangerous, from the pneumonic affections which atmospheric vicissitudes are so apt to produce. As is the case with all other epidemic diseases, considerable diversity occurs in the grade of violence which different epidemics of this affection assume. Some epidemics are so mild, that the disease is attended with but little difficulty, and passes by numbers who are still susceptible of it. At other times the disease manifests a violent and dangerous character, and seizes on almost every individual, whether old or young, who has not yet had the disease.

Prognosis.—Whooping-cough rarely terminates fatally, unless by the supervention of bronchitis, hydrocephalus, pneumonia, cynanche trachealis, apoplexy, or marasmus. As these secondary and superadded affections are, however, by no means uncommon—especially in variable and humid seasons—the disease, upon the whole, deserves to be regarded as one of considerable danger. It would appear to be a vastly more dangerous affection in northern or cold climates than in the mild and equable regions of the middle and southern latitudes. Rosenstein states, that in Sweden there were 43,393 deaths from this disease, between the years 1749 and 1764—and of these, 5832 deaths occurred in the year 1755 alone. (Richter.)

* Richter, Specielle Thérapie.

In general, the younger the patients, the more apt is the disease to terminate fatally. Cullen observes, that by far the greater number of those who die of this disease, are children under three years of age. When it attacks weak and delicate infants within the first few months after birth, it is always attended with great danger; yet robust and healthy infants, even at this early age, generally pass through the disease without much difficulty or danger.

In children born with a scrofulous diathesis, whooping-cough is exceedingly apt to call the strumous affection into action. Scrofulous ophthalmia, and glandular tumors in the neck, frequently succeed whooping-cough. I know of no disease which is more to be dreaded than whooping-cough in subjects of an hereditary consumptive habit. Where there is a predisposition to the formation of tubercles, or where these exist in an incipient and dormant state, an attack of whooping-cough will rarely fail to develop phthisis pulmonalis.

In many instances, the disease terminates in chronic bronchitis, in which case the expectoration becomes purulent, and symptoms of hectic supervene. This is especially apt to occur when the patient takes cold from exposure to a damp and variable atmosphere—a circumstance which always greatly aggravates the violence and danger of the disease. I have seen but few deaths from whooping-cough which were not attended with bronchitis, purulent expectoration, and hectic symptoms, from having taken cold. The matter expectorated in these cases has generally a very peculiar appearance, resembling more a mixture of cream and mucus, than anything else I know.

In some instances, an accidental cold will renew the cough, and protract it for several months, in a state of great violence, after it had nearly disappeared. Cases are often thus protracted for five or six months. When the disease assumes a chronic character, from cold or some other casual circumstance, it sometimes ultimately terminates in hydrocephalus—more especially if the patient labors under the irritation of difficult dentition, and in children habitually subject to disordered bowels. Cynanche trachealis also frequently supervenes during whooping-cough, and this is most apt to happen in children of robust and full habits, during the early stages of the disease, and is almost always the consequence of cold. The occurrence of cynanche in this affection is attended with the greatest danger.

It is observed by Richter, that a profuse watery diarrhœa coming on suddenly in this disease, when pneumonic symptoms attend, is always to be regarded as one of the most dangerous occurrences. Death, he says, often follows such a discharge very speedily. The appearance of aphthæ in the mouth and fauces, in the latter period of the disease, is also a very unfavorable sign. Œdematous swelling of the feet and face is not an uncommon occurrence in this affection, and when it takes place towards the conclusion of the complaint, it is rarely followed by unfavorable consequences. When such swellings supervene in the commencement of the disease, however, they portend much danger—more especially if they are accompanied with a turbid, milky urine. (Richter.) Hufeland observes, that the occurrence of some degree of strangury in the advanced stage of the complaint, is generally soon followed by a manifest mitigation of the symptoms of the disease. A sudden cessation of the cough, it has been remarked, is an unfavorable occurrence, and is frequently followed by pulmonary inflammation. In general, the more fever there exists in this affection, the more violent and dangerous it may be considered.

It is asserted by some writers, (Hufeland, loc. cit., p. 420; Lentin, *Memorabilia*, p. 36; Jahn, *Kinderkankn.*, p. 399,) that children affected with some chronic cutaneous affection, as *tinea*, itch, &c., very rarely take this disease; and if they do become affected with it, they almost invariably pass through it in the lightest manner. This however, is contradicted by others—particularly by Hoffman and Haase.

Among the affections which are properly called *sequela* of this disease, the following are the principal. Strumous swellings, dropsy, epilepsy, ophthalmia,

rickets, general cachexy, aneurism, deafness, dementia, paralysis, and phthisis pulmonalis. I have known most of these affections to occur as consequences of whooping-cough; and of these, epilepsy, struma, phthisis pulmonalis, and ophthalmia, appear to be the most common. When these and other consequences are taken in view—and they are by no means uncommon—we cannot but regard this disease as always one of very serious import. Whooping-cough is, indeed, as much to be dreaded on account of the many affections which are apt to supervene during its course, or to remain after its disappearance, as for its own proper power, however violent it may be. When perfectly free from any adventitious complications, it cannot be regarded as a disease of much danger, unless in very young and feeble subjects.

Causes.—There exists no other cause, so far as we know, capable of producing this affection, than the peculiar contagion which is generated by the disease itself. Richter observes, that besides this contagion, cold in conjunction with humidity, may give rise to this affection. For this opinion it does not appear that there exists sufficient grounds; and it seems to me just as improbable, as that small-pox or measles should arise from accidental causes. It may be said that all these diseases must have primitively originated from accidental causes—for the first case could not have arisen from a contagion generated by the disease itself. Nothing, in truth, is more mysterious and incomprehensible than the origin of those diseases which we now find to be engendered and propagated by a specific agent alone, elaborated by the living body actually suffering under the disease. The only solution we can offer, and it is indeed vague enough, is, that in the infinite combinations of which the material elements of the universe are capable, agents may have been evolved by a peculiar concurrence of circumstances, which had the power of originating these affections in the human system. It is in this way alone that we can give any plausible explanation of the occasional rise of new diseases—which, when once originated, propagate themselves by elaborating their own specific causes. Whatever may be our speculations in relation to this curious and interesting subject, the cause of whooping-cough, so far as we can ascertain, is in all instances a specific contagion.

Riverius, Linnæus, Dessault, Rosenstein, and more recently Clesius, maintain that whooping-cough is produced by the inhalation of microscopic animalcula.

Whooping-cough does not appear to possess a contagious character until it has made considerable progress, (Richter;) or until the second or convulsive stage has supervened. The contagion of this disease, although very active, does not extend far from the body of the affected person. It is, accordingly, almost always prevented by separating the healthy from the affected portion of families.

Autopsic phenomena. The appearances discovered on post-mortem examination are various, and often quite contradictory. Much diversity must necessarily result in this respect from the various accessory affections which are so common in this complaint, and the different periods of the disease at which death occurs. We cannot, for instance, expect to find the same post-mortem appearances in a case which terminates fatally in consequence of pneumonia, as in one in which death occurs from apoplexy; nor is it reasonable to presume that there should be much uniformity in the autopsic phenomena, where the immediate cause of death is so various, or dependent on such a diversity of accidental affections. As the respiratory organs are the parts most obviously implicated in the disease, the principal attention of pathologists has of course been always directed to them for a solution of the pathological character of this affection. Many writers speak particularly of the frequency of traces of inflammation in the mucous membrane of the *bronchia* and *larynx*. Strong, Cullen, Astruc, Lettson, and Danz, mention these appearances as by far the most common; and more recently, Whatt and Marcus have adduced striking instances of this kind. The former lost three of his own children by this disease, and in each, the marks of previous inflammation in the mucous membrane of the bronchia were very conspicuous throughout its whole extent. Marcus gives but two dissections in which bronchial inflammation

was discovered; and in one of these a considerable quantity of pus was found in the air-passages, the smaller branches of which were in the most intense state of inflammation, approaching, in some parts, to gangrene.

In some instances, the lungs have been found exceedingly congested, and the air-cells choked up with an extremely viscid mucus without any traces of bronchitis whatever. Lobenstein-Doebel relates an instance in which a considerable portion of the diaphragm was covered with a number of small pustules containing a purulent fluid.*

After all, it is incontestable, that in many cases of death from this disease, no morbid appearances whatever were discovered on dissection, and there are good grounds for believing, that the inflammation and other phenomena which have been detected on post-mortem examination, have no essential connection with the disease, but are altogether adventitious or secondary.

Proximate cause.—The opinions that have been advanced concerning the nature or proximate cause of this disease, are extremely various and contradictory. Hoffman considered it as depending on an acrid serum in the lungs. Sydenham ascribes it to the effects of irritating effluvia, cast off from the blood into the lungs, in consequence of the suppression of the insensible transpiration by the skin, from cold and damp air. *Huxham* and others placed the primary seat of the disease in some morbid condition of the intestinal canal; *Butler*, in the liver; and some have considered it as the consequence of gastric irritation, or, according to Stoll, of crude and bilious matters in the stomach. The opinion which appears to be most prevalent at the present day is, that the disease depends on a peculiar bronchial inflammation; and this doctrine would seem to receive much support from the appearances which are occasionally detected in the mucous membrane of the bronchia and trachea on post-mortem examination, as well as from the febrile movements which, in most instances, attend the disease. As, however, ordinary bronchial inflammation does not excite the train of symptoms which characterize this disease, the advocates of this doctrine are forced to assume the position, that the inflammation in question is of a specific kind, capable of exciting the peculiar convulsive cough which distinguishes the disease. Whatever plausibility this doctrine may seem to possess on a superficial view of the subject, strong, and in my opinion, insurmountable objections may be urged against its validity. It is true, indeed, that fever is no uncommon attendant of this disease, and that unequivocal cases of inflammation are sometims manifested on post-mortem examination. It is, nevertheless, equally true, that in many instances no febrile symptoms whatever occur during the early period, and occasionally none during the whole course of the disease; nor are the signs of previous inflammation in the respiratory passages always manifested on autopsical examination. That inflammation must frequently supervene in the trachea and bronchia in a disease in which the lungs are so violently and frequently agitated as they are in the present one, is indeed to be expected. Besides this accidental source of pulmonary inflammation in whooping-cough, there can be no doubt that the lungs are especially predisposed, by the same circumstance, to the injurious influence of atmospheric vicissitudes, and consequently to the supervention of pulmonary catarrh, or bronchial inflammation.

From these circumstances, we have the strongest ground for believing that the inflammation which is frequently detected on dissection in the mucous membrane of the respiratory passages, is always accidental, and by no means essential to the perfect development of the disease. It may be observed, moreover, that bronchial inflammation is probably far from being so common in this disease as one might be led to think from the appearances discovered on dissection; for it must be recollected, that death occurs chiefly in such instances only as are attended by unequivocal symptoms of inflammation, and we may, therefore, reasonably expect to find traces of inflammation in such cases, although in the

* Richter's Specielle Thérapie.

milder instances no such inflammatory condition may exist. If, however, bronchial inflammation be the proximate cause of the disease, it must, necessarily, be present in all cases, in the mild as well as in the violent instances of the malady, a circumstance which is decidedly contradicted by almost universal observation. The only dissection I ever witnessed of a subject that had died of this disease, presented no evidence of the existence of previous inflammation in the bronchia. The patient died suddenly of convulsions during a violent paroxysm of coughing. That inflammation of the mucous membrane of the bronchia is not essential to this disease, or its proximate cause, is proved, moreover, by the fact, that bronchitis is rarely, if ever, attended with a violent cough, much less with that peculiar cough which distinguishes this disease. Bronchitis, too, in its acute form, is always rapid in its course, and is attended with strong fever and a continued sense of tightness and oppression in the breast. In the chronic form, the expectoration is invariably purulent, and entirely distinct in its character from the ropy and transparent mucus which is expectorated in whooping-cough. It is also almost invariably attended with the usual symptoms of hectic fever. When cough depends on acute inflammation of the respiratory passages, it almost always begins to decline as soon as the secretion of the bronchial mucus becomes copious. In whooping-cough, however, the reverse very generally obtains. During the first few weeks, there is seldom much mucus secreted in the bronchia; but as soon as this secretion becomes more abundant, which occurs after the second or third week, the cough also acquires much more violence, and especially that convulsive character which distinguishes it from other varieties of cough. Very commonly, moreover, the slight symptoms of fever which accompany the development and first few weeks of the disease, vanish entirely in the second stage, when the cough becomes more spasmodic and violent in its paroxysms. (Richter.) This circumstance most assuredly does not favor the idea, that the disease is of an inflammatory character; for if this were the case, the cough, one should think, would decline with the fever; instead of which, it is always found to acquire much more violence.

It appears to me that whooping-cough is essentially a spasmodic or nervous affection, the proximate cause of which consists probably in a peculiar irritation of the eighth pair, or pneumogastric nerves.

If we attend closely to the phenomena which immediately precede and accompany a paroxysm of whooping-cough, we cannot but perceive unequivocal manifestations of a purely spasmodic condition of the respiratory apparatus. The sense of stricture in the breast and of the glottis, which is felt immediately before the fit of coughing—the sudden and convulsive character of the cough—the peculiar constrictive feeling in the præcordia—the stridulous respiration, all point to a spasmodic state of the pulmonary system. That the irritation which calls forth the convulsive action of the diaphragm, and the other parts immediately concerned in the act of coughing, is seated in the eighth pair of nerves, may, I think, be inferred from the known agency which these nerves have in the production of the various phenomena manifested by the respiratory apparatus. The interesting experiments of Professor Nasse also afford strong support to this opinion. In a series of experiments, instituted for the purpose of elucidating the pathology of cough, this experimenter found that, on bruising or strongly pinching the par vagum so as to break down its structure, a violent convulsive cough was invariably excited. By injuring in the same manner the *diaphragmatic* nerve, no such effect ensued. According to these experiments, the act of coughing is performed almost wholly by the sudden spasmodic contraction of the diaphragm. By opening the abdomens of various animals, and exposing the lower surface of this muscle, he saw distinctly its violent convulsive contractions during the cough, which was excited by bruising, with a pair of forceps, the pneumogastric nerves. The peculiar tone of the cough, and the sense of constriction which is felt at the glottis, may arise from the irritation extending to the

recurrent branches of the vagus nerve; and that this irritation is peculiar or specific in its character, may be inferred from the nature of its exciting cause.

Treatment.—It is very generally believed that whooping-cough, though susceptible of much mitigation, is wholly uncontrollable in its progress, and that no treatment is capable of materially shortening its course. This, I am persuaded, is an unfounded opinion. Sydenham, Werlhof, Hufeland, and several later German, Italian, and French writers, admit that it may be arrested in its course; but it is asserted that this can never be done before the fourth week after its commencement. (Richter.) Be this as it may, my own experience does not permit me to doubt of its susceptibility of being curtailed in its progress; and many well-authenticated observations in confirmation of this fact, might be collected from recent publications.

Although inflammation and fever do not constitute essential conditions of this disease, yet blood-letting may often be employed in the first stage of the disease with manifest advantage. An unusual or preternatural momentum of the circulation is not to be regarded as a harmless circumstance, even in diseases strictly spasmodic. Whatever may be the essential character of a disease, if the pulse is full and active, blood-letting may be regarded as proper, and its employment will generally be productive of some benefit. In the present disease, if the abstraction of blood should even afford no direct advantage over its characteristic symptoms, it tends materially to lessen the danger which may result from the violent cephalic congestions during the paroxysms of coughing, as well as to diminish the liability to the accidental supervention of inflammation. In cases attended with bronchial or pneumonic inflammation, bleeding is obviously indispensable, and should be employed promptly and decisively both in a general and *local* way. To tamper with the ordinary remedies in cases of this kind, would be exposing the patient to great danger; for, when inflammation supervenes, it is this, and not the original disease, which claims our principal attention, since the danger and obstinacy of pulmonic inflammation must be especially great in an affection which, like the one under consideration, keeps up so constant and violent an irritation of the respiratory organs, by the frequency and violence of the cough. *Leeching* on the breast is particularly valuable in cases of this kind.

The extensive sympathetic relations which subsist between the intestinal canal and the various organs of the body cause it to participate, in a greater or less degree, in almost every form of disease to which the human system is liable. Whatever be the nature of the malady, and in whatever system of structure it may be principally located, the alimentary canal, sooner or later, suffers functional disturbance, giving rise either to a remora of its recrementitious contents, or to a vitiated secretion of the fluids which are poured into it. These latter consequences become in their turn sources of intestinal irritation, and I need not say how great a tendency such irritation has to aggravate and sustain diseases, whatever may be their original source or character.

The bowels are almost always in an unnatural condition in whooping-cough. The evacuations are sometimes bilious, or almost wholly mucous; and, in many instances, dark and exceedingly offensive stools are passed. In prescribing for whooping-cough, it is of much consequence, therefore, to attend to the condition of the bowels, and to keep them in a moderately loose state throughout the whole course of the disease. Very active purging, however, is improper, as it tends to increase, rather than to moderate the intestinal irritation when frequently repeated. A grain or two of calomel in the evening, with a small dose of rhubarb on the following morning, will in general answer very well for this purpose. When there is considerable febrile irritation present, small doses of the sulphates of soda or magnesia may be preferable.

Emetics constitute an important class of remedies in the majority of pulmonary diseases. They are especially indicated in those affections of the respiratory organs in which there is an abundant secretion of bronchial mucus. Much of the suffocative distress experienced by patients affected with whooping-cough,

arises from the large quantity of viscid mucus which is lodged in the trachea and bronchia; and it is chiefly by effecting the discharge of this impediment to free respiration, that emetics prove serviceable in this disease. It is not improbable, however, that a part of their beneficial operation may depend also on the impression which they produce on the pneumogastric nerves in the stomach. They are particularly useful in the whooping-coughs of infants; these are unable to throw off the viscid mucus that clogs the respiratory passages; and instances of death by suffocation from this cause have frequently occurred. When, therefore, the cough in very young children is violent, and attended with symptoms of impending suffocation, an emetic should be immediately administered; or the fauces irritated with a feather, so as to bring on speedy vomiting. In cases of this kind, the sulphate of zinc will generally answer better than any other article, from the promptitude of its operation. It must nevertheless be observed, that the very frequent repetition of emetics, more especially antimony, is apt to bring on much weakness and irritation of the stomach, which may have a permanent injurious influence on the future health of the patient. I have in general preferred the ipecacuanha to every other article of this kind. Dr. Fothergill speaks very highly of the following combination as an emetic in this affection:

℞.—Pulv. chel. cancror. ʒss.
Tart. antimon. gr. ii.
Misce.

Of this 1, 1½, or 2 grains, may be given at a dose, according to the age of the patient. It has been supposed that the union of some absorbent with the emetic is peculiarly beneficial in this affection. The syrup of squills also forms an excellent emetic in very young patients. I have frequently prescribed this preparation, in union with a small portion of antimonial wine, with a very good effect. We may also prescribe the antimonial wine in union with an emulsion of assafœtida, with much advantage as a palliative.

The *narcotics* furnish us with several very valuable remedies for the treatment of this disease. Of these the *belladonna* is the most celebrated, and unquestionably by far the best article of this kind we possess. Professor Borda, who, I believe, was the first who employed this remedy in whooping-cough, speaks of its powers with unqualified praise. He asserts that, in a number of instances, he has found it to remove every vestige of the disease in ten or twelve days; and that where it did not remove the disease entirely, it rarely failed to mitigate it very considerably. He observes, moreover, that he has known cases, which appeared to be beyond the hope of recovery, restored by this remedy. Hufeland and Alibert, not to add the testimony of many other writers, speak in terms nearly equally favorable, of the virtues of this narcotic in the present disease. A large mass of evidence might be adduced from the current medical publications, illustrative of the valuable powers of the belladonna in this singular malady. From my own experience, I can testify with confidence to its virtues as a remedy in this affection. I have within the last six years prescribed it in perhaps twenty cases, and in the majority of them with manifest advantage.* Since the publication of my work on the materia medica, my good opinion of the value of this remedy has been considerably increased. In two cases it arrested the complaint almost wholly in the course of *eight* days, although the disease was in both instances exceedingly violent. It does not appear, however, to answer any useful purpose in cases that are attended with fever and bronchial inflammation. In instances of this kind, the lancet with blisters, or tartar emetic ointment rubbed on the chest, is the means upon which our reliance must be almost entirely placed. In the purely spasmodic form of

* The dose should be one drop of the tincture for every year of the child's age, three times daily. When the narcotic effect is obtained, cease the remedy, and resume when it subsides.

the disease, however, and where all symptoms of inflammation are absent, it is often singularly efficacious.*

The extract of conium, lactuca virosa, hyoscyamus and opium, have also been favorably mentioned as palliatives in this disease. Dr. Butler states that he has frequently used the following mixture with marked benefit.† *Opium* is objectionable, both on account of its constipating effect, and its tendency to determine the blood to the brain. Some writers recommend the *tincture of cantharides*.‡ Dr. Sutcliff asserts, that when given to the extent of producing strangury, it will sometimes, in a great measure, remove the disease in four or five days. This practice has also been pursued with success by Hufeland; and Lettson speaks very favorably of it. Sutcliff used it according to this formula.§ M. Fresnoi asserts that he has used the extract of the *rhus vernix* with much success in this disease. He gave half a grain, with half an ounce of syrup, every three hours.

Antispasmodics are frequently prescribed in whooping-cough, and sometimes with temporary advantage. An aqueous solution of assafœtida will occasionally palliate the symptoms in cases unattended with fever or strong pulmonary irritation. This article answers the double purpose of an expectorant and an antispasmodic. I have, in a few instances, known material relief obtained from a mixture of the vinegar of squills, and an emulsion of assafœtida.

Expectorants also will occasionally mitigate the violence of the symptoms. Dr. Pearson strongly recommends the following mixture, and I have myself known it to give considerable temporary relief.‖

Tonics may, in some instances, be used with much benefit in whooping-cough. The Peruvian bark is particularly extolled by Dr. Cullen as a remedy in this disease; but its good effects are in a great degree confined to the latter stages of the disease. In some instances, the cough assumes a chronic character—continuing long after the usual period of its termination; and these cases are frequently connected with chronic bronchitis. If they are not subdued by efficient measures, they gradually undermine the constitution, until the system is worn down, and the patient dies in a state of marasmus, or under symptoms of phthisis pulmonalis. In such cases strong doses of cinchona, or quinine, are often peculiarly serviceable. This tonic may also be very beneficially used in cases of a purely spasmodic character, where the disease becomes protracted, and kept up by habit.

Among the mineral tonics, *arsenic* has been most commended for its powers in this affection. It is, however, wholly inadmissible in cases attended with febrile irritation or bronchial inflammation. Dr. Ferriar placed much reliance on this remedy in cases free from fever. He asserts that, according to his own experience, "arsenic is the only remedy which promises to shorten the disorder effectually. I have," says he, "employed this article in several cases of infirmary

* [Dr. Jackson, formerly of Northumberland, once published some excellent observations upon the influence of belladonna in curing whooping-cough. He found the remedy very efficacious in this disease.—Mc.]

† ℞.—Extract. conii gr. iii.
Magnes. sulphat. ℈i.
Aq. carui ʒv.
Syrup. rhæd. ʒi.—M. Take thirty drops three times daily.

‡ Armstrong, Chambers, Millar, Buchholtz, Loder and others, speak much in favor of this remedy in whooping-cough.

§ ℞.—Tinct. Peruv. spirit. ℥i.
Tinct. opii camphor. ℥ii.
Tinct. cantharid. ℈ii. Two drachms of this mixture are to be taken thrice daily.

‖ ℞.—Aq. fontanæ ℥i.
Syrup. ʒiii.
Subcarbonat. sodæ gr. xxv.
Vin. ipecac. ʒi.
Tinct. opii gr. vi.—M. The sixth part, every four or five hours, is the proper dose for a child between one and two years old.

patients, with tolerable success; and I have occasionally given it in private practice with so much advantage, that I think it deserving of further trials." I formerly employed this remedy frequently; and in some instances its good effects were very obvious. The proper dose for a child between one and two years old, is two drops of Fowler's solution, twice or thrice daily. I have usually given it in union with small doses of the extract of belladonna, or conium.

The *lobelia inflata* has proved an excellent remedy in my hands, in whooping-cough. Within the last four years, I have prescribed this article in a very considerable number of cases, and very generally with some advantage, and in several instances with the most decided success. It not only often mitigates the violence of the cough, but it has appeared to me unequivocally to have shortened the course of the disease in several cases. I have usually given the saturated tincture in union with the syrup of squills, in doses of ten drops of each, four or five times daily, to a child about two years old. To several children about this age, I gave as much as twenty drops of the tincture of lobelia, and I have always found it strongly palliative when it excited sickness or slight vomiting.

External rubefacient or revulsive applications are particularly valuable in cases attended with bronchial inflammation, or strong and dangerous sanguineous congestions in the head. Dr. Gregory advises frictions with the following embrocation, along the whole track of the spine, and over the chest.* Frictions with *tartar emetic ointment* over the præcordial region, will, in many cases, make a powerful impression on the disease. This practice originated with Autenreith, and has been much employed by the German physicians. Dr. Meyer has removed all the symptoms of whooping-cough, in a few days, by the application of morphium to the external surface. He applies a small epispastic to the epigastric region, and after removing the epidermis, he applies to the denuded surface half a grain of morphium, triturated with a small portion of starch. The application is to be renewed every evening. An occasional emetic should also be administered, particularly in infants, in order to free the bronchiæ from the viscid mucus.† When the disease is complicated with pneumonic affections, blisters and rubefacients, in conjunction with venesection, and especially *leeching* on the breast, are indispensable.

When the disease becomes complicated with chronic bronchitis, in the advanced stage of its course, the *balsam copaiva* is a very valuable remedy. I have, in a few cases of this kind, prescribed this article with the most decided benefit; and I know, indeed, no other remedy that promises so much as this one, where chronic bronchitis attends.

Various inhalations, also, have been extolled for their good effects in this disease. The nitrous acid vapor, and the fumes of tar, have been particularly recommended for this purpose. I have employed the nitrous acid vapor, in a few cases, with some benefit.

Dr. Gregory states, that he has derived great advantage from small doses of calomel, (a grain twice a day,) with a few grains of scammony in the latter stages of whooping-cough, attended with symptoms of marasmus.

Change of air, and exercise by gestation, generally have an excellent influence in tedious and obstinate cases, attended with much exhaustion. In instances of this kind, a change of air, says Dr. Gregory, "is often the only thing that gives the patient a chance of life." I have seen one very remarkable recovery effected by removing the patient into the country, and the free use of a milk diet. In cases attended with bronchial inflammation, this measure is inadmissible, as it rarely fails to aggravate the symptoms immediately.

* ℞.—Antimon. tart. ℈ii.
Tinct. cantharid. ℥i.
Aq. rosar. ℥ii.—M. The tartar emetic is to be dissolved in the rose water, and then the tincture of cantharides added to it.

† Archives Générales, Oct. 1829.

The diet should be light and digestible, and it is particularly important to guard the patient against the influence of a cold, variable, and damp atmosphere.

Sect. III.—*Asphyxia.—Suspended Animation.*

The term asphyxia is here used to designate two varieties of suspended animation; namely, those cases which result from the total suspension of the function of respiration, by preventing the ingress of the atmospheric air to the lungs, or by breathing an air incapable of converting venous into arterial blood; and those cases of apparent death which result from the temporary destruction of the sensibility and irritability of the system, by the influence of certain external causes.

The first variety includes those cases that are produced by hanging, drowning, or strangulation, and by the inhalation of carbonic acid; or some other irrespirable gas. The second variety embraces the cases that are produced by a stroke of lightning or electricity, and by the protracted influence of intense cold.*

1. *Asphyxia from drowning.*—When a person who has been submerged in water until all manifestations of life are destroyed, is taken out, the face exhibits a turgid and livid appearance; the eyes are open and staring; the limbs somewhat stiff; the tongue usually thrust a little beyond the teeth; and, in most instances, the epigastrium is tense and tumid.

Considerable controversy has existed concerning the mode in which drowning causes death. Many have contended that suffocation is produced by the water rushing into, and filling up the cavity of the lungs. Haller, P. Frank,† Louis and Portal‡ mention cases in which the lungs were charged with an abundance of water, sometimes frothy and bloody. On the other hand, it has been satisfactorily ascertained, that in many instances of death from drowning, very little or no water whatever gains admission into the lungs. Tissot,§ Goodwin,‖ Kite,¶ Roesler,** and many other later writers, have published numerous observations in illustration of this fact; and it is now, I believe, universally admitted that so long as the larynx retains any degree of irritability, no water can enter into the respiratory passages; and, consequently, that whenever water is found in the lungs, it must have entered into them after life was destroyed. Such is the peculiar sensibility of the respiratory passages, that the moment water or any other substance not in harmonious relation with them comes in contact with the mucous membrane of the larynx, the glottis is instantly thrown into a state of spasmodic constriction, which wholly prevents the ingress of the irritating fluid into the trachea. When the sensibility and contractility of these parts are extinguished, however, the water may gain admission into the lungs, and hence it is not uncommon to find more or less of this fluid in the air-passages of those who have lain a long time under water.

Some have supposed that drowning destroys life by apoplexy—that the functions of the brain are at once destroyed by strong vascular congestion and extravasation. Portal,†† who entertained this opinion, states that he found the vessels of the brain, as well as the right auricle and ventricle of the heart, jugulars, and descending cava, exceedingly turgid with blood in subjects that had died by drowning. This opinion is also advocated by Littre, Kite, Walter,‡‡ and Boerhaave.

* Good's Study of Medicine, vol. iii. p. 367.

† System ein. Vollständiger Med. Polizei, vol. i. p. 186.

‡ Instruction sur le Traitement des Asphyxiés.

§ Avis au Peuple, p. 426.

‖ On the Connection of Life with Respiration, &c., p. 14.

¶ An Essay on the Recovery from apparent Death.

** Diss. Inaug., &c. See Ed. Med. and Surg. Journ., No. lxxxii. Dr. Roesler states, that in forty-five experiments he made on animals, he did not in a single instance find anything more than a very small portion of frothy mucus about the bifurcation of the trachea.

†† Loc. citat. See also Observ. sur les Effets des Vapeurs Méphitiques.

‡‡ De Morbis Peritonei et Apoplexia.

On the contrary, however, many observations have been published, which go to show that vascular congestion within the head, though an occasional, is by no means a common or general phenomenon. Champreax and Faissole assert, that they found no marks whatever of an unusual sanguineous congestion in the brains of persons who had died by submersion.* Schrage† and Kuehn‡ state that they even found the vessels of the brain almost entirely empty. Fothergill, in a number of experiments made on animals with a view of illustrating this subject, fully confirms these observations;§ and Dr. Currie states that in every instance he examined, he found the vessels of the brain entirely free from distension. In nearly all instances, however, the lungs are strongly engorged with blood, and the bronchial tubes generally contain more or less of a frothy and bloody mucus.

Bichat has given a very interesting and satisfactory explanation of the mode in which death is brought on by submersion, and other analogous causes of asphyxia. When respiration is interrupted, the blood ceases to undergo the necessary chemical changes in the lungs; and black or venous, instead of florid and arterial blood, is immediately sent to the left side of the heart, and thence throughout the system. Now it is well ascertained that the regular transmission of arterial or red blood to the brain is indispensable to the performance of its functions; and, therefore, one of the first effects of interrupted respiration towards the destruction of vitality is a cessation of cerebral action, for want of red or arterial blood to excite the brain. The direct and instantaneous consequence of this cessation of cerebral action is cessation of the animal functions, from want of excitement in the organs of these functions by the nervous influence and the red blood; and from the same causes the heart soon ceases to act, and the circulation stops. Death from asphyxia, by submersion, strangulation, or the inhalation of mephitic gases, commences, therefore, in the *brain*, and those vital actions that are immediately dependent on the exercise of its functions—namely, sensation, voluntary motion, thought, and the mechanical effort of respiration—cease a short time before those actions which constitute what are called the organic functions; that is, the circulation, absorption, exhalation, &c., are obliterated.‖

Much difference of opinion has been expressed as to the time a person may remain under water, in a state of asphyxia, with sufficient vitality remaining to afford a chance of being resuscitated by proper restorative measures. Mr. Brodie thinks it extremely improbable that resuscitation can be effected after the heart has ceased to act; and this, he supposes, always occurs within a few minutes after the cessation of the respiratory function. Dr. Paris, and other late writers, have expressed the same sentiments on this point. Unless, however, we reject no small amount of evidence from sources of unquestionable credibility, we are forced to admit that there is, in some instances, a possibility of resuscitation after a much longer period of submersion than Mr. Brodie and Dr. Paris are willing to allow. The experiments that have been performed on animals, in relation to this point, afford us no satisfactory results. Dr. Davy informs us that he has never been able to resuscitate dogs after they had been under water *two* minutes; and Dr. Colhoun, of this city, states that in some experiments he made on cats, "they invariably died after six minutes' submersion."¶ Dr. Roesler asserts that he succeeded in resuscitating two rabbits, one after $5\frac{3}{4}$, and the other after $9\frac{1}{2}$ minutes' submersion; and a cat after having been submersed $11\frac{3}{4}$ minutes. He observes, however, that he "several times failed when the animals were taken out of the water instantly after they seemed to have expired." Experiments on inferior animals cannot, however, furnish us with any certain data with regard to the human subject. We learn, nevertheless, from these experiments, that very

* Erfahr u. Warneh über d. Ursach d. Todes bei Ertrunk. Dantzig, 1772—as quoted by Richter.
† Diss. de Submersis, 179.—Richter, Sp. Thérap.
‡ Diss. de Causa Mortis Submersorum.—Richter, Sp. Thér.
§ A New Inquiry into the Suspension of Vital Actions, &c.
‖ Bichat on Life and Death, p. 136.
¶ Gregory's Practice, second American edition, p. 247.

considerable diversity occurs as to the time that animals may remain under water and still retain sufficient vitality to render resuscitation possible. We see it vary in the same species of animals, and in experiments conducted under precisely the same circumstances, from a few to ten or eleven minutes; and we cannot doubt that a corresponding diversity occurs, in relation to this point, in the human subject. Instances of resuscitation after a period of submersion varying from fifteen to thirty minutes are on record; and although doubts have been expressed as to the accuracy of these statements, we can scarcely, with propriety, permit our skepticism on this point to carry us so far as to reject, positively, the testimony upon which they are made. That such instances of recovery are, however, extremely rare, is sufficiently evident from the fact that the possibility of resuscitation after such protracted periods of submersion is now very generally doubted.

Various circumstances may contribute to hasten or retard the complete destruction of vitality from drowning. Submersion in very cold water will no doubt destroy life sooner than when the water is warm, or near the temperature of the body; for, in the former case, the animal temperature will be much more rapidly and completely abstracted than in the latter. Previous debility from disease, spasms and convulsions, injuries sustained in falling into the water, asthma, an apoplectic predisposition, intoxication, torpor from excessive cold, an overloaded stomach, &c., may all have a tendency to lessen the chance of resuscitation from asphyxia by submersion; and it is not improbable, moreover, that some diversity may exist in different individuals as to their respective powers of vital resistance under similar circumstances of submersion.

The morbid appearances observed on dissection, in persons who have died by drowning or strangulation, are: turgescence of the jugulars, venæ cavæ, right auricle and ventricle of the heart, pulmonary arteries, and of the pulmonary vessels. The left auricle and ventricle are generally empty and flaccid; and in some instances there is considerable vascular congestion of the brain, but very rarely so much as to justify the belief that any apoplectic torpor proceeded from this cause. In nearly all instances a considerable portion of water is found in the stomach, but the lungs very generally contain very little or no water whatever.

Inquiries have been made to discover some mark by which we may decide whether dead bodies found in water have died by drowning, or whether they have been thrown into the water after they had been deprived of life. M. Orfila has paid particular attention to this subject, and has examined in detail all the indications that have been mentioned as available guides in making up a judgment on this point. According to his observations, more or less water always enters into the stomach when death occurs by drowning, but never when the *dead* body is thrown into water. The result, therefore, of his inquiries on this subject is, that the only certain sign of submersion during life, is the presence in the stomach and respiratory passages of water similar to that in which the submersion took place; provided that it has not been injected into the stomach after death, and that the water in the lungs is found in the ultimate ramifications of the bronchia; and provided, also, that the body was not found in the vertical position. The pressure of a frothy fluid in the air-passages, he says, is only to be regarded as a presumptive evidence of submersion during life, and this is strengthened by the appearance of an unusual portion of water in the pulmonary tissue, since this fluid never penetrates so deeply after death as during life by the efforts of respiration. The absence of a frothy mucus in the respiratory tubes does not, however, afford any proof that death did not occur by submersion.*

Treatment.—When a person is taken out of water, and it may still be deemed proper to make attempts to effect resuscitation, he should be immediately well dried, wrapped in blankets, and conveyed to a place convenient for the necessary applications. The principal object to be aimed at, is a restoration of

* Revue Médicale, tom. xiii. p. 347.

the action of the lungs, at the same time that warmth is gradually communicated to the body.

With this view, artificial inflation of the lungs has always been regarded as the most important resuscitating means we possess in cases of this kind. The inflation may be made by blowing the air in the mouth through a tube, or by a common bellows, whilst the nostrils are held close, to prevent the return of the air by that channel. It is to be particularly recollected, however, that very forcible inflation is calculated to defeat our purpose, even in cases where the chances of resuscitation may be presumed to be considerable. M. Leroy d'Etiolles has recently paid particular attention to this subject, and has strongly set forth the injurious consequences of forcible insufflation into the lungs in asphyxia. Leroy, Duméril and Magendie have ascertained by repeated experiments, that sheep, foxes, deer, rabbits, &c., may be speedily killed by rapid and strong inflation of the lungs, even when the insufflation is made with the mouth. When air is forcibly thrown into the lungs, it may lacerate the delicate structure of the air-cells and cellular texture of the lungs, and thus destroy all possibility of restoring the pulmonary functions; for it appears from experiments performed by the same gentleman on dead human subjects, that the pulmonary tissue may be readily ruptured by forcible inflation.* In endeavoring to restore the action of the lungs, the air should therefore be but moderately forced into the trachea—alternating the acts of inflation with compression of the thorax and abdomen, so as to imitate the mechanical process of respiration. M. Leroy proposes to introduce two fine needles, so as to penetrate the edge of the diaphragm, and to pass a gentle current of galvanism through this muscle. This has been practised on inferior animals in a state of asphyxia, with complete success, after more than five minutes of submersion. The galvanic circle must be alternately interrupted and closed, so as to imitate the act of respiration. Whenever the circle is closed, the diaphragm contracts, and enlarges the thoracic cavity, and the air is drawn in on taking off the communicating wires, the diaphragm resumes its former position, and expiration takes place. The practice of compressing the chest and abdominal parietes in alternation with gentle insufflation is particularly recommended. By this method the blood in the vessels of the abdomen and breast is put in motion, and propelled towards the heart and lungs, and the contractibility of the diaphragm is excited.

At the same time that the efforts to carry on artificial respiration are made, heat should be gradually communicated to the body, by wrapping it in dry and warm flannel, and by applying heated cloths, or warm bricks wrapped in flannel, or bottles filled with warm water, to the lower extremities and body. Care must be taken, however, that the warmth be communicated in a *gradual* manner, for the sudden application of a high degree of heat could not fail to do irreparable injury, by destroying the small degree of remaining excitability of the organization. Frictions with dry flannel or stimulating substances, such as powdered mustard or capsicum, will contribute to excite the circulation and impart warmth to the body. The injection of stimulating fluids into the rectum will be proper, more especially when some manifestations of returning life have been established by the foregoing measures. For this purpose, a solution of ammonia, with wine, or camphor, or warm diluted brandy, may be used; and where the abdomen is tense and tumid, we may inject a warm infusion of senna, in wine, with the view of exciting the action of the bowels.

Galvanism, also, has been employed as a resuscitating agent in cases of this kind. Wiedemann speaks highly of this influence, more especially when directed upon the external organs of generation. He asserts that he has known the most excellent effects produced by it when employed in this manner. It must be observed, however, that both electricity and galvanism can be employed

* Rapport sur un Mémoire de M. Leroy d'Etiolles, relatif à l'Insufflation du Poumon, &c.—Revue Médicale, vol. xiii. p. 328.

with a prospect of advantage only when communicated in a very weak state, for when strongly applied, they tend to exhaust rather than to increase the vital energies.

Various other modes of exciting the vital powers have been recommended; such as exposing the eyes to the direct rays of the sun; applying volatile and stimulating fluids to the Schneiderian membrane; plucking the hairs; tickling the soles of the feet, sides, and arm-pits; acrid substances applied to the tongue; burying the patient up to the head in warm ashes or sand, &c.

Venesection has been much recommended in asphyxia from submersion; and some have particularly advised opening one of the jugulars. Some advantage may, perhaps, be occasionally obtained from this measure, where a flow of blood can be procured, by its tendency to relieve the oppressive venous congestion of the lungs. In general, however, no blood can be obtained by opening a vein, except in cases of very transient submersion, or where the action of the heart has been re-excited by the means already mentioned; and here there is much reason to apprehend that injury rather than advantage would generally result from this operation.

The return of the vital actions is at first manifested by transient and weak twitches of the muscles of the face, particularly of those about the lips; succeeded by feeble, irregular and convulsive efforts to breathe; spasmodic tremor and agitation of the extremities; a small and weak pulse, beating at very long intervals; and a discharge of frothy fluid from the mouth. By degrees, sensation and the power of motion return; the lips assume a red hue, the skin becomes soft and warm, particularly about the scrobiculus cordis, and in some instances vomiting takes place.

When recovery has been so far effected, the utmost degree of caution is necessary to prevent, on the one hand, over-excitation by stimulants, and on the other, sinking from deficient support of the vital energies by appropriate excitants. I knew an instance where a person, after much exertion, was so far resuscitated from a state of asphyxia by submersion as to breathe freely, and to manifest consciousness and the power of voluntary motion. The persons about him were directed to give him, from time to time, certain portions of warm wine whey. This was wholly neglected, and in four or five hours he sunk and expired. Warm wine, or weak brandy toddy with warm aromatic ptisans, as infusions of balm, sage or catnep, should be given from time to time, according to the state of the pulse, and the patient must be kept *perfectly at rest in a dry and warm bed*, with the air freely circulating through the room, if the weather be warm.

Our efforts to effect a resuscitation in cases of this kind, where the period of submersion has not been so protracted as to preclude all reasonable hopes of ultimate success, should not be too readily abandoned. Instances have occurred in which the signs of returning life did not manifest themselves for more than an hour after commencing with the resuscitating measures. It has been said, and the observation appears to me very correct, that there is much reason to believe that some lives are lost in this way for want of duly continued exertions to re-establish the vital actions. In still-born infants, I have known two instances of ultimate resuscitation, where the signs of returning animation were not noticed for above forty minutes after the commencement of the usual measures. It should also be observed, that well-authenticated instances of recovery are on record where the resuscitating means were not applied until many hours after the person had been taken out of the water; and hence, where the time of submersion has been short, and for want of assistance, means are not employed, it may still be proper to make suitable efforts to effect a resuscitation, although several hours have elapsed before this can be done. De Haen, whose authority cannot be questioned, asserts that he resuscitated a person seventeen hours after he had been taken out of the water; and other similar instances might be adduced, which, though less remarkable, perhaps, are equally encouraging to late attempts of this kind.

2. *Asphyxia from the inhalation of irrespirable gases.*—The most common cause of this variety of asphyxia is the inhalation of *carbonic acid gas*. When this aëriform poison is undiluted with atmospheric air, it will destroy life almost instantaneously, by abolishing, at once, all the sensibility and irritability of the nervous system. When mixed with a portion of atmospheric air, its sedative effects on the brain are less vehement and sudden; giving rise to vertigo, faintings, insensibility, asphyxia. or death, according to the degree of its purity and the length of time during which persons are exposed to its influence. When life is suddenly destroyed by inhaling this gas in an undiluted state, the dead body is pale, collapsed, and flaccid. In instances, however, where death or asphyxia is caused by a gradual destruction of the vital powers, from the gas being more or less mixed with atmospheric air, the face exhibits a tumid and livid appearance, the veins about the neck and head are turgid, the tongue somewhat swollen, the lips blue, with suggilations on different parts of the surface, and the body remains warm for many hours, or even for several days. On dissection, the sinuses of the brain, the jugulars, right side of the heart, pulmonary arteries, the lungs, and the cavæ, are always strongly congested with black and generally fluid blood. The pulmonary veins, left side of the heart and aorta, on the contrary, are empty, or contain but a small quantity of blood. The ventricles of the vein are commonly charged with a considerable portion of bloody serum, and the cellular structure about the head and neck is often found infiltrated with the same kind of fluid. The bronchia are filled with a frothy mucus more or less tinged with blood; and the mucous membrane of the stomach and intestines usually exhibits a dark red, ecchymosed, and distended appearance. The epiglottis is generally erect, and the glottis patulous.*

Carbonic acid gas produces its fatal effects on the animal economy both by excluding the requisite portion of oxygen or respirable air from the lungs, and thereby preventing the conversion of venous into arterial blood, and by a peculiar and exceedingly powerful sedative principle independent of its mere irrespirable character. Animals die much more speedily when confined in this and other mephitic gases, than when placed in an exhausted receiver, or when the atmospheric air is otherwise excluded from the lungs;† and frogs, worms, leeches, and snails, are killed in a few hours by being placed in carbonic acid gas, although capable of living a long time when simply deprived of atmospheric air.‡ These facts show conclusively that in addition to the mere exclusion of respirable air, there is also a deleterious impression made on the vital powers by inhaling this gaseous poison; and it acts, therefore, at once like submersion or strangulation, and as a powerful sedative poison.

There are several other gaseous substances, which, when inhaled in a concentrated form, produce immediate asphyxia or death. The fumes of sulphur, sulphureted hydrogenous gas, nitrous gas, azote, hydrogen, and certain gaseous poisons, generated by putrefying animal and vegetable substances, destroy life with more or less rapidity. Of these gases, azote, and pure hydrogen, appear to destroy life simply by their not being respirable, or by preventing the chemical changes of the blood in the lungs, in the same manner that submersion or obstruction of the trachea produces this effect.§

Treatment.—When the asphyxia from this cause (carbonic acid gas) is *incomplete*, with some degree of sensibility remaining, the patient may be generally soon recovered by conveying him immediately into the open air, supporting him in a sitting posture, dashing a little cold water upon his face and breast, applying dry frictions to the extremities, and, as soon as he can swallow, giving him small portions of cold wine and water.

* Portal. Observations sur les Effets des Vapeurs Méphitiques.

† Fothergill. A New Inquiry into the Suspension of Vital Action in cases of Drowning and Suffocation.

‡ Carminati. De Animalium ex mephitibus, et noxiis halitibus interitu ejusque Causæ, p. 89.

§ Bichat on Life and Death, p. 242.

If the unfortunate individual is in a state of *perfect* asphyxia, without any manifestations whatever of life, we may sometimes succeed in effecting resuscitation by the following course of management. He should be speedily carried into a free and cool air, divested of his clothes, and laid upon a sheet spread on the floor, or the ground, with his head and shoulders somewhat raised. Cold water must now be dashed upon his breast, and cloths dipped in cold water applied to the head; or he may be supported in a sitting posture, and the water poured on the head. In some cases, the moment the cold affusion is made, a convulsive respiratory effort is excited. In an instance to which I was called about a year ago, I found the patient without the slightest indications of vitality. Having stripped off his clothes, I dashed a bucket full of cold water over the head and breast, and almost at the same moment, I observed a short convulsive gasp. By continuing the affusions at short intervals, the respiratory efforts were repeated, at first very weak, and at intervals of nearly a minute, and by the additional aid of stimulating frictions, the respiration was fully established in about an hour after the first symptoms of returning life.

Frictions with the flesh-brush, or with stimulating embrocations, are important auxiliaries in re-exciting animation in cases of this kind. We may also derive advantage from volatile stimulating applications to the mucous membrane of the nose, by means of a feather—such as aqua ammonia, ether, and camphorated spirits. At the same time, also, stimulating enemata should be used, particularly a solution of the carbonate of ammonia in a mucilaginous fluid. Richter speaks favorably of the injection of cold water and vinegar for this purpose. If the act of respiration be not soon excited by the cold affusions, artificial inflation of the lungs must be resorted to, in the way mentioned above. Upon these two means we must chiefly rely in our efforts to effect resuscitation. When the respiration is partially established, but continues very laborious, and with a rattling noise in the bronchia, considerable benefit will sometimes result from the abstraction of from eight to ten ounces of blood from the arm. As soon as the respiration is fully established, the patient should be wiped dry, and laid in a comfortable bed, and small portions of warm wine, or wine-whey, or some other gentle stimulating beverage allowed.

Galvanism has been employed, and, in some instances, with manifest advantage, in asphyxia from mephitic gases. The galvanic current should be weak, and passed along the course of the pneumogastric nerves, by placing the negative conjunctive wire in contact with the scrobiculus cordis, and the positive pole with the part immediately over the par vagum in the neck, just below the sterno-mastoid muscle.

After the vital actions have been re-established, the arterial excitement, in some instances, becomes violent and tumultuous. The heart palpitates vehemently; the pulse is full, strong, and hard; the vessels of the head turgid, and a disposition to heavy sleep ensues. Under these circumstances, venesection is indispensable, and the blood should be suffered to flow until the activity of the circulation is considerably moderated. In general, much caution is necessary after resuscitation is effected, neither to excite the vital powers too much—which may readily be done—nor to suffer them to languish for want of some gentle stimulus.

3. *Asphyxia from electricity.*—When electricity is passed through the animal system, in currents of moderate intensity, it excites and invigorates the vital energies; but when its intensity is great, it suddenly suspends, or entirely destroys the sensibility and irritability of the nervous system, and gives rise to more or less complete asphyxia, or immediate and irrecoverable loss of vitality.

The appearances exhibited by persons who have been struck by lightning, vary considerably. In most instances, red streaks may be noticed on the breasts and arms, of an ecchymosed and highly irritated appearance, and generally of a zigzag form. The hair is usually singed on some parts; and small blisters, like those produced by a scald, occur on different parts of the body. Sometimes blood is discharged from the ears, and suggilations of large extent are frequently

found on the trunk and extremities. Internally, structural lesions are but rarely detected in persons who are killed by lightning. In general, the heart is turgid with blood, but the lungs are usually collapsed, and entirely free from vascular congestion. The blood is always deprived of its coagulability by a fatal stroke of electricity; and the body commonly enters into putrefactive decomposition with extraordinary rapidity. When the electric stroke does not entirely destroy the vital powers, the face is generally red and bloated; more or less blood often issues from the mouth and nose; respiration is slow and very laborious; the pulse is extremely weak and irregular, or entirely absent; and spasmodic twitches of the muscles of the eyelids, mouth, and throat, sometimes occur. Persons who are recovered from a state of asphyxia caused by lightning, generally suffer for a long time afterwards with tremors, painful sensations, swellings, and some degree of numbness in the extremities, more especially in the legs. Such individuals usually retain a particular susceptibility to the electric influence, and are apt to feel a peculiarly uneasy feeling on the approach of a thunder storm.

The *treatment* of asphyxia from this cause does not differ from that which is mentioned for asphyxia from mephitic gases. *Cold affusions* are particularly valuable to re-excite the latent vital energies in cases of this kind. Cold water should be copiously and frequently dashed over the whole body, and frictions diligently made with the flesh-brush or pieces of rough flannel. Galvanism and electricity also have been especially recommended in asphyxia from a stroke of lightning. Stoll asserts, that animals in a state of asphyxia from an electric shock, have been speedily recovered by a second shock of this power;* and Bernt assures us that in a case produced by a stroke of lightning, a second shock affected a resuscitation.† M. Abilgaard also has related some instances of asphyxia from this cause, in inferior animals, in which resuscitation was effected by a second shock of electricity.‡

4. *Asphyxia from cold.*—When the body is subjected to the influence of intense cold, the superficial blood-vessels shrink; the surface becomes pale and contracted; respiration oppressed; the extremities benumbed and weak; and finally, an irresistible desire to sleep comes on; and, unless speedy aid be obtained, insensibility, asphyxia, and death, inevitably ensue. For the mode in which these effects are produced by low temperature, the reader is referred to the article *Cold*, page 40.

Instances of resuscitation from asphyxia, caused by intense cold, are by no means uncommon; and cases are related in which reanimation was effected many hours, or even several days, after the asphyxia was produced.§ The principal resuscitating means in cases of this kind is the gradual communication of warmth to the body. The introduction of warmth requires, however, the utmost degree of caution; for, if the heat be rapidly communicated, it will inevitably destroy the remaining vitality, or should a partial recovery ensue, fatal gangrene would be the certain consequence. When a person is found in a state of insensibility from cold, he must on no account be immediately conveyed into a warm chamber, or placed near the fire. His body should be immersed in spring water, or water fresh drawn from a well. Burying the body in fresh snow has also been recommended for this purpose. Richter states, that the snow-bath is decidedly the most important resuscitating means we possess in cases of this kind. After the body has been suffered to lie in water or snow for forty or fifty minutes, it should be carefully dried with soft pieces of flannel, wrapped in blankets, and conveyed into an unheated chamber. Gentle frictions with flannel should now be resorted to, and if no manifestations of respiration occur, artificial inflation of the lungs should be practiced. If these efforts succeed in restoring symptoms of

* Rettungsmittel in plötz. unfällen., p. 63.

† Vorlesungen über. d. Rettungsmittel beim Scheintode, p. 121; as quoted by Richter, Spec. Thérap., vol. viii. p. 647.

‡ Loc. Med. Havnien. Collectan., &c., t. ii.—Good.

§ Kruinitz. Oekonom. Encyclopædia, Th. xv. p. 261. Richter, Sp. Thér.

life, the temperature of the room should be very gradually increased, and bottles filled with lukewarm water laid to the feet, and about the body. When the power of deglutition is restored, moderately warm ptisans—such as balm, sage, or elder-blossom tea, and diluted warm wine, may be given with advantage; but the stronger stimulants must be rigidly interdicted.

Sect. IV.—*Pneumothorax.*

The collection of aëriform fluids in the cavity of the pleura, is termed *pneumothorax*. This is no very uncommon occurrence, and is always attended with the most distressing effects on the action of the lungs and heart. In most cases the confined air is fetid, resembling the smell of sulphureted hydrogen. This is always the case when the passage formed between the cavity of the pleura and the air-cells is the result of a gangrenous eschar of the surface of the lungs, and where more or less purulent matter is effused into the cavity of the chest. When such a communication is effected by ulceration, tuberculous softening, or otherwise, the air is forced into the cavity of the pleura during the acts of respiration, and as its return into the lungs must always be very slow, and often wholly impossible from the valvular form of the opening, it accumulates with more or less rapidity, until the lungs are so greatly compressed as to render respiration extremely difficult, and finally to arrest it entirely. The lung of the affected side becomes, at last, compressed into a very small and nearly solid mass; and when the disease occurs in the left cavity, the heart and mediastinum are usually forced completely into the right side of the chest. The affected side of the chest becomes manifestly bulged out and the intercostal spaces wider and more raised or puffy than natural. The abdomen, also, usually becomes more prominent in consequence of the depression of the diaphragm against the abdominal viscera by the distending force of the confined air.

Patients affected with pneumothorax experience great pectoral oppression and difficulty of breathing, attended generally with more or less palpitation of the heart, and often with severe pain under the sternum or the affected side of the chest. They are usually obliged to remain in a sitting posture, and can never rest even for a moment recumbent on the sound side. M. Rayer has related a case in which the patient was forced to remain day and night resting on his knees and elbows in bed. When the pneumothorax occurs in the left side of the chest, the palpitation of the heart is usually felt in the right side only; but this can take place only in very violent cases, where the confined air is so abundant as to force the heart completely into the right cavity of the thorax.

The *diagnosis* of this affection is not attended with difficulty except to those who are not experienced in mediate auscultation and percussion. By these diagnostic means, the practiced ear may arrive at certain conclusions as to the existence of air in the cavity of the chest. "Whenever we find one side of the chest sounding more distinctly than the other, and at the same time perceive the respiratory murmur distinctly in the least sonorous side, and not at all in the other, we may be assured that there exists pneumothorax in the latter side of the chest." Even when, on percussion, we find both sides equally sonorous, the existence of this affection may be inferred, if auscultation do not enable us to perceive the respiration on one side whilst it is audible on the other. When the disease supervenes on pleuritic effusion into the cavity of the pleura, the affected side will yield a dull sound when percussion is made, before the pneumothorax commences. "As soon, however, as the air begins to accumulate, the resonance of the chest returns in some degree, in the situation occupied by the air, without, however, being as distinct as in the sound side. Day after day the extent and intensity of this resonance increase *without any return of the sound of respiration;* and if there had previously been any remains of the respiratory murmur, even this now totally vanishes." But when the lung of the affected side is

attached to the costal pleura by means of a very short cellular tissue, the diagnosis, even by auscultation and percussion, is rendered more uncertain; for at the point of adhesion the respiration will still be audible. (Laennec.) When, on examining the chest with the stethoscope, that peculiar metallic sound is heard, which Laennec calls *metallic tinkling*, and which has been compared to the sound of a drop of water falling into a bottle half full, it indicates the existence both of air and a puriform matter in the cavity of the pleura, with a fistulous opening between the cavity of the chest and the bronchia. This metallic sound, says Laennec, "exists only in that variety of pneumothorax which is complicated with empyema; and may be considered as a pathognomonic sign of this combination in conjunction with a fistulous opening into the bronchia." The *metallic tinkling* of pneumothorax may be distinguished from that which occurs from a large tuberculous excavation in the lungs partly filled with a purulent fluid, by the greater weakness of the sound, and the narrow space to which it is confined in cases of this latter kind.

There is some risk in mistaking emphysema for pneumothorax in examining by percussion and auscultation; particularly by those who are not accustomed to this mode of exploration. M. Laennec points out the following difference in the results obtained by the employment of these diagnostic means in these two affections. "In pneumothorax, the respiratory murmur is wholly absent, except at the point between the scapula and spine, corresponding to the roots of the lungs. In emphysema, the respiratory sound is never completely inaudible, and there is a slight *rattle* which never occurs in the former complaint. Pneumothorax comes on rapidly, and cannot continue long without giving rise to dangerous symptoms, or even proving fatal; emphysema, on the contrary, comes on slowly, and is never so severe as to confine the patient to bed, or incapacitate him for his ordinary occupation."

Post-mortem appearances.—On cutting into the cavity of the pleura, the air usually rushes out with very considerable force. In many cases there is a small portion of sero-purulent fluid found in the chest; and in nearly all instances, the surface of the pleura is more or less extensively covered with a thin layer of pseudo-membranous matter. Not unfrequently, slight adhesions occur between the costal and pulmonary pleura of the affected side. The lung of the side affected is usually compressed into a small, irregular, and compact mass; and if the disease is in the left cavity, the heart and mediastinum are pushed completely within the right cavity of the thorax. Frequently a fistulous opening may be detected between the cavity of the pleura and the bronchia.

Causes.—Pneumothorax frequently occurs in consequence of tuberculous excavation near the surface of the lungs, and the formation of a fistulous opening into the bronchia. *Chronic pleuritis*, also, may give rise to this affection. Some of the cases related by M. Itard, originated from chronic pleurisy. When the disease arises from chronic inflammation of the pleura, it is always preceded by the effusion of sero-purulent matter into the cavity of the chest, and in such cases no opening into the bronchia usually occurs. It would appear that in cases of this kind, the air within the cavity of the pleura "is the product of a chemical decomposition of the effused albuminous and puriform fluid. In proportion as the gas is thus developed, the effused fluid becomes absorbed, until the disease has acquired the character of complete pneumothorax. The rupture of a vomica, giving rise to a communication between the bronchia and the cavity of the pleura, appears to be no uncommon cause of this affection. When the disease occurs in this way, the air in the thorax is generally associated with a purulent fluid. Pneumothorax may also arise from the extrication of fetid gas, by the decomposition of a gangrenous eschar dissolved and discharged into the cavity of the chest." (Laennac.)

Treatment.—This is always an extremely dangerous affection; for although the mere accumulation of air in the cavity of the pleura may not of itself be so formidable, yet the organic lesions with which it is almost invariably connected,

are generally of such a nature as to admit of but slender hopes of cure, or even of a considerable prolongation of life. It would seem, nevertheless, that spontaneous cures of this affection have taken place. Such a favorable termination is, however, an extremely rare occurrence, and is supposed to take place in the following manner. The lung being strongly compressed by the air that rushes into the cavity of the pleura, through the aperture made into the bronchia, gradually collapses, if no adhesions exist, until it remains quiescent. In this state of collapse and rest, the lung is in the most favorable condition for the healing of the opening through which the air passed. "If the opening heals, the air will be absorbed, and the patient gradually recover."

The general remedial management must, of course, be modified according to the nature of the lesion or primary affection, upon which the pneumothorax depends. When there is reason for believing that the air compressing the lungs is the result of chronic inflammation of the pleura, some advantage may be expected from counter-irritating applications to the chest; such as blistering, pustulation with tartar emetic ointment, cupping, *moxa*, issues, setons, &c. Some benefit may also result from gentle courses of mercury, and from the internal exhibition of diuretic remedies. In cases manifestly connected with tuberculous softening, and fistulous opening into the bronchia, little or no advantage can be looked for from any remedies of this kind.

Different opinions have been expressed as to the propriety of puncturing the thorax for the purpose of giving exit to the confined air in this affection. Laennec speaks favorably of this operation, although it does not appear that he has himself resorted to it with success in any case of this kind. The only instance in which he performed this operation, terminated fatally in a few hours after the puncture was made. The opening was made between the fifth and sixth ribs, and very little air, and no purulent matter, escaped from the incision. This appears to have been a case of empyema conjoined with pneumothorax, for when after the death of the patient, an incision was made about the middle of the fourth intercostal space, a considerable quantity of pus was discharged; and on making an opening into the chest near the junction of the third rib with its cartilage, much fetid gas rushed out. This case cannot, therefore, be regarded as a fair test of the value of this operation in pneumothorax. Riolan states that he has seen several instances of the successful operation of paracentesis on patients who were supposed to labor under dropsy, without anything having been evacuated from the chest but air. (Laennec.) These, doubtless, were cases of simple pneumothorax, and may be regarded as encouraging examples of the usefulness of this operation in the present affection, when uncombined with empyema.

"Pneumothorax," says Laennec, "complicated with liquid effusion, and still more, with pulmonary fistula, is a case of a most serious nature, and leaves little hopes of a cure being effected. This, however, must not be regarded as quite impossible even in the severest cases. I formerly proved the possibility of the cicatrization of tuberculous excavations; and the observations of Bacqua, Jaymes, and Robin (*Journ. Gén. de Méd.*, 1813), to which I could add a more recent case of the same kind, sufficiently prove, that even in such cases, we may attempt this last resource with some prospect of success." That the operation in question is a proper one, in perhaps every variety of pneumothorax, can scarcely be doubted; for even where the prospects of an ultimate cure cannot be entertained, we may at least reasonably expect to prolong the patient's life by giving exit to the confined air, and thereby preventing suffocation from the compression of the lungs. The object of the operation is to prevent the fatal compression of the lungs, by the confined gas, and to place this organ in a state of quiescence, so favorable to the healing of the aperture through which the air passes from the bronchia into the cavity of the pleura. Although the propriety of this operation seems to be obvious in this affection, yet we find but very few instances recorded of its having been performed in pneumothorax. There is a highly interesting case reported in the *Medico-Chirurgical Review*, (January,

1829,) in which the chest was punctured; but although great relief was the immediate consequence of the evacuation of the air, the patient in a few days sunk under the disease.*

A case of pneumothorax is related by Dr. Davy, in which this operation was performed with entire success. The patient was affected with hæmoptysis, which came on after "a severe fall on the left side of the chest, received eighteen months previously." While under treatment for this affection in the Military Hospital at Chatham, he was one morning seized with a violent fit of coughing, and symptoms of pneumothorax immediately succeeded.

The thorax was punctured with a trocar between the eighth and ninth ribs, "the integuments and intercostal muscles having been previously divided with a scalpel." As but little air escaped by this opening, it was "concluded that its escape had been prevented by adhesions of the pleura at the point where the puncture was made;" and on the following day the operation was repeated just below the left papilla. From this orifice a large quantity of air rushed out "as if from a blow-pipe." The relief obtained was immediate and great, and the patient continued to improve regularly. This and the preceding case, says Dr. Johnson, are the only instances in which this operation was performed for pneumothorax in England.

CHAPTER V.

CHRONIC DISEASES OF THE HEART.

Sect. I.—*Of the Diseases of the Heart.*

There is scarcely a subject in pathology that has attracted so much attention of late years, as the chronic affections of the heart. The researches of Corvisart,† Kreysig,‡ Testa,§ Laennec,‖ Burns,¶ and Abercrombie,** have thrown great light on this important class of diseases, and it is from these sources chiefly that the following observations are drawn.††

Symptoms.—The general symptoms are nearly the same in every variety of structural disease of the heart. More or less habitual dyspnœa almost universally attends in affections of this kind; and a careful attention to the particular modi-

* The patient was a member of our profession, and was visited during his illness by the majority of the most eminent physicians and surgeons of London. The incision was made between the sixth and seventh ribs, anteriorly. When the pleura was punctured, "a rush of air instantly issued forth with a loud hissing noise, and strong enough to extinguish several candles. The relief was almost instantaneous. The patient turned on his back, and breathed with comparative freedom." On the fourth day after the operation, the patient was found to be sinking, and, after a strong paroxysm of convulsions, expired on the afternoon of this day. On dissection, an aperture was discovered at the division or cleft between the two lobes. This aperture was circular, about the size of a crow-quill, and evidently fistulous. It communicated with a small tuberculous excavation. The right lung was much more tuberculous than the left; but the tubercles were in a quiescent state. Med. Chir. Rev., Jan. 1829, p. 482.

† Essai sur les Maladies et les Lesions Organiques du Cœur.

‡ Die Krankheiten des Herzens. Berlin, 1814–17.

§ Delle Malattie del Cuore.

‖ Treatise on the Diseases of the Chest, translated by J. Forbes, M. D.; 3d edition.

¶ Observations on some of the most frequent Diseases of the Heart. By Allan Burns, 1809.

** Contributions to the Pathology of the Heart. Transact. Med.-Chirurg. Society of Edinb., vol. i. 1824.

†† [The late Dr. Hope, of London, published at a later date an excellent work on this subject.—Mc]

fications of this symptom, is of great importance in a diagnostic point of view (Corvisart). The acts of inspiration are either very quick, and effected more by the action of the ribs than by the diaphragm, and somewhat wheezing; or the patient breathes as if he had been walking rapidly, and appears to make unusual efforts in filling the lungs; or, finally the respiration is calm, and without any particular effort, but the air does not appear to enter into the lower portion of the lungs. Mental agitation, or corporeal exertions, particularly walking, or ascending acclivities or stairs, never fail to bring on more or less violent paroxysms of dyspnœa; and in the latter stages of the disease, the most trifling excitements of this kind give rise to extremely distressing spells of suffocative breathing, attended with great weight and constriction in the breast, inexpressible anxiety, a turgid and usually livid hue of the face, particularly of the lips, which are swollen and purple; distension of the veins in the neck and head, and an expression of extreme distress and suffering in the countenance. These paroxysms of dyspnœa often last but a few minutes, and rarely continue beyond half an hour, and subside rapidly to the ordinary state of respiration. During the early period of the disease, or in cases of a less serious character, the patient is able to lie down, (though rarely with any degree of ease on the right side,) but the sleep is much disturbed by alarming dreams, frequent startings, and spells of palpitation—obliging the patient suddenly to sit up in bed. In violent or inveterate cases, however, the patient is sometimes obliged to remain day and night in a sitting or half-sitting posture—every attempt to lie down being immediately followed by the most harassing paroxysm of palpitation of the heart and suffocative breathing. One of the most frequent symptoms of cardiac diseases is irregular action of the heart. Sometimes the heart beats tumultuously and indistinctly, which has been compared to the bubbling of boiling water; and at others it seems to be in a state of tremulous agitation. More commonly, however, it beats vehemently against the side of the thorax, so as to enable a person distinctly to hear its throbs, and to communicate a motion to the whole superior part of the body. *Syncope*, too, is no uncommon occurrence in diseases of this kind. The patient is liable to occasional attacks of *partial* fainting, often of long continuance, during which he experiences a feeling of great oppression and constriction in the region of the heart, a partial loss of consciousness and sensorial power, inexpressible anxiety in the præcordia, with an extremely feeble and fluttering or intermitting pulse, and scarcely any perceptible respiration. From this state of adynamia, he sometimes passes suddenly into deep syncope, approaching the character of asphyxia, and after a short period, again suddenly recovers his entire consciousness.* In some cases, paroxysms of *angina pectoris* occasionally supervene; and instances occur in which the cardiac disease gives rise to convulsions and apoplexy.† The habitual aspect of the countenance, during the intervals of the exacerbations of the dyspnœa, is usually pale and cachectic, with a leaden lividity of the prolabia, and puffy swelling under the eye. Œdema of the feet and legs is usually one of the earliest symptoms of organic affections of the heart. In the progress of the disease, œdema gradually extends higher, and often invades the scrotum, labia, and even the trunk. In some instances, the pulse differs but very little from its natural state, except during the occasional paroxysms of the dyspnœa and palpitation; but more frequently it is irregular, intermitting, and often has a peculiar jarring beat, or is sharp, exceedingly firm, and incompressible. Organic diseases of the heart are very generally attended with a peculiarly irritable temper, and a disposition to melancholy and hypochondriasis.‡ Symptoms of indigestion, too, are very apt to occur in diseases of this kind; and in many instances there exists a strong tendency to hemorrhage, particularly from the lungs and nose. Patients laboring under cardiac affections are liable to sudden and severe pains in different parts of the body.

* Kreysig, loc. cit., b. i. p. 332.
† Dr. Forbes. Edition of Laennec on the Diseases of the Chest.
‡ Testa, loc. cit.

Dr. Adams has given the history of a very remarkable case, in which no pulse was to be felt in any artery of the body for six weeks; neither were the movements of the heart perceptible by the hand applied to the chest; but an obscure, undulating motion could be heard by applying the ear to the region of the heart. On dissection, the heart was found large and flabby; the semilunar valves of the aorta were completely ossified; and the coronary arteries "were so completely converted into bone as to be quite solid, having no perceptible cavity except at the distance of an inch from their origin."*

Dissection shows that cardiac diseases have a particular tendency to produce great engorgement of the capillary vessels, and it is to this circumstance, no doubt, that we have to ascribe the dropsical effusions into the cellular structure of the cavity of the chest, so common in these affections. In almost all those who die of organic disease of the heart, the mucous membrane of the alimentary canal exhibits a deep red, or violet color, and, in most instances, "the liver and capillaries situated beneath the serous, mucous, and cutaneous tissues, are strongly gorged with blood.† A very vivid redness of the internal surface of the heart and large vessels is also a very common phenomenon in subjects who have died of such affections, and this is particularly noticed where the affection consists in a morbid dilatation of the ventricles of the heart.

Causes.—The etiology of the diseases of the heart is enveloped in much obscurity. There exists, no doubt, a natural predisposition in some individuals to affections of this kind; but our notions concerning the nature of this predisposition amount only to some plausible conjectures. An inordinate irritability of the heart and arteries has been mentioned as a circumstance predisposing to cardiac affections; and an original defect in the muscular energies of the heart, as well as a disproportion between the activity of this organ and the blood-vessels, may also, occasionally, be the foundation of such diseases. It is said, that the predisposition to organic affections of the heart is, in some instances, manifestly hereditary, and its occasional prevalence in certain families renders this opinion very probable. Dr. Forbes refers to Lancisi, Albertini, Morgagni, Portal, Corvisart, and Testa, for striking examples of this kind; and a remarkable instance is related in the eleventh volume of the Medical Commentaries. A *strumous habit* is considered by Testa as a strong predisposing cause of organic affections of the heart; and Dr. Forbes says, that his own experience has led him to the same conclusion. "In this case," he observes, "I have thought that the disease is developed at a more early period than under other circumstances. Perhaps in this case an original disproportion of the parts usually exists." The *remote* causes of the diseases of the heart appear to be numerous, and very diverse in their characters. The following have been mentioned as the most common and powerful.

1. *Moral Causes.*—Corvisart, Kreysig, and others, assert that mental emotions are among the most frequent and powerful causes of structural diseases of the heart; and from the well-known influence of violent affections of the mind on this organ, there can be no doubt, indeed, of their tendency, when frequently repeated, or of protracted duration, to give rise to such diseases. Dr. Forbes states, that he attended a poor woman "affected with organic disease of the heart, of many months' standing, which was suddenly produced by horror at seeing her infant scalded to death."‡ Instances have occurred, in which sudden terror, anger, or excessive joy, has determined the blood so vehemently to the heart as to cause immediate rupture of its ventricles.§

2. *Gout and rheumatism.*—Organic diseases of the heart are probably more

* Cases of Diseases of the Heart, &c. By Robert Adams, M. B., &c. &c. Dublin Hospital Reports.

† Laennec, loc. cit., p. 592.

‡ Laennec on the Diseases of the Chest, third edition.

§ Richter, Specielle Thérapie, b. v. p. 129.

frequently occasioned by metastasis of gout or rheumatism, than by any other cause. Sauvages mentions instances of cardiac affections, alternating with paroxysms of gout;* and Dr. Scudamore has related a remarkable case of palpitation of the heart of three years' standing, which suddenly disappeared on the supervention of an attack of articular gout.† *Rheumatism*, however, appears to be still more frequently concerned in the production of cardiac affections. Dr. Cox has adduced some interesting examples of the dependence of the diseases of the heart on metastasis of rheumatism. Numerous cases of organic diseases of the heart and pericardium, which he met with during his connection with Guy's Hospital, were referable to, or connected with rheumatism.‡ Dr. Cox states, moreover, that his observations have led him to believe, that "the majority of cases of organic diseases of the heart in *young people*," are connected with rheumatism. Dr. James Johnson also observes, that "long and attentive observation" has convinced him, "that a very considerable proportion of those active enlargements or hypertrophiæ of the heart which are now so frequently met with in practice, are dependent on rheumatism." Dr. David Dundas,§ and Dr. Hawkins‖ also, have published observations illustrative of the rheumatic origin of organic cardiac diseases; and Dr. Forbes has related several interesting instances of this kind.¶

3. *Cutaneous diseases.*—The repulsion of chronic cutaneous eruptions may give rise to organic diseases of the heart. Kreysig says, that when cardiac affections arise from causes of this kind, the disease is apt to occur in the external or internal membranes of the heart; and according to the observations of Testa, the most common structural lesions resulting from repelled cutaneous affections, are thickening and induration of the pericardium. Osiander mentions ulcerations of the external surface of the heart and of the pericardium;** and Meckel has related a similar instance of disorganization of these parts, apparently the consequence of repelled cutaneous eruptions. Cardiac affections have also been known to result from the suppression of habitual perspiration of the feet, and from the healing up of old ulcers and issues. (Richter.)

4. *Syphilis* is also mentioned as no uncommon cause of diseases of the heart. Corvisart was of opinion that the excrescences which are sometimes found on the valves, usually depend on a syphilitic taint; and Lieutaud particularly refers to this disease as a cause of various structural disorders of the heart.†† Mr. Bertin, however, thinks, that the influence of this cause, in relation to cardiac diseases, has been much overrated; an opinion which he was led to adopt after an experience of twenty years in the venereal hospital. Laennec also rejects the opinion of Corvisart with regard to the syphilitic origin of the excrescences on the valves.

5. *Diseases of other organs*, particularly such as are attended with long-continued and severe dyspnœa, are especially apt to give rise to hypertrophy or dilatation of the heart, through the constant efforts this organ is called on to perform, in order to propel the blood into the lungs, against the resistance opposed to it by the cause of the dyspnœa." Chronic pulmonary catarrh, phthisis pulmonalis, chronic peripneumony, empyema, and emphysema of the lungs, frequently give rise to these cardiac affections, and, almost necessarily, where there exists a congenital disproportion between the size of the heart and the diameter

* Nosologia Method., tom. i. p. 518.

† A Treatise on Gout and Rheumatism, fourth edition, p. 44.

‡ Observations on Acute Rheumatism and its Metastasis to the Heart, by Thos. Cox, M. D., Lond., 1824.

§ Med.-Chir. Transact., vol. i.

‖ Rheumatism and some Diseases of the Heart Lond., 1826.

¶ Original Cases, &c., p. 112, and p. 165. See also a note at p. 597 of his Translation of Laennec on the Chest, fourth edition.

** Denkwürtigkeiten, &c., Th. i p. 146, as quoted by Richter.

†† Hist. Anatom. Méd., tom. ii. ob. 510–516.—Sprengle.

of the aorta. (Laennec.) Chronic diseases seated in the abdomen, are also mentioned among the occasional causes of organic affections of the heart. Testa thinks that induration and enlargement of the liver may give rise to diseases of this kind; but Corvisart, more correctly I think, regards the hepatic affection as the consequence, rather than the cause, of disease of the heart. "More probably," says Forbes, "it may be merely a concomitant, and the consequence, of those chronic disorders of the stomach and upper bowels which are too frequent in all classes of people to be safely admitted as either a common cause or effect of affections of the heart." It is supposed that visceral enlargements within the abdomen tend to produce cardiac diseases by compressing the large vessels, and by impeding the circulation through the affected viscus, in consequence of which greater efforts of the heart are made to oppose these causes of obstruction.

6. *Scurvy* has also been supposed to be capable of giving rise to structural disease of the heart, more especially to a morbid softness and flabby state of its structure.

7. *Congenital disproportion* of the different parts of the heart, and particularly between the left ventricle and the aorta, is no doubt at the bottom of the majority of the instances of hypertrophy and morbid dilatation. Where such a condition of the central organs of the circulation exists, everything which is capable of causing a long-continued preternatural momentum of the circulation, or an impediment to the free passage of the blood through the lungs, or sudden and forcible determinations to, and congestion of the heart and large vessels, may readily give rise to aneurismal dilatation of this organ. Playing wind instruments, carrying heavy burdens, or straining in lifting heavy weights, running, the inhalation of suffocating vapors, protracted rigors of intermitting and other febrile diseases, intoxication, mental emotions, lymphatic and other tumors pressing on the carotids or some other arterial trunk, and a great variety of other causes of a like tendency, will be apt to produce a structural disease of the heart in individuals thus predisposed by a congenital conformation of this organ.

Blows, falls, and external injuries of the chest, may likewise give rise to organic cardiac diseases. Inflammation of the heart, too, is frequently concerned in the development of affections of this organ. Indurations, morbid softening, excrescences, pseudo-membranous formations, adhesions, effusions into the pericardium, ulcerations, &c., may be regarded as the immediate consequences of cardiac inflammation, in whatever way this latter condition may be produced.

Diagnosis.—The diagnosis of the diseases of the heart is attended with much difficulty. The symptoms of organic affections of this organ are particularly liable to be confounded with simple hydrothorax, hydro-pericardium, neuralgic angina pectoris, and even with asthma. Laennec asserts that none of the symptoms mentioned above can at all be regarded as pathognomonic, or sufficient to indicate disease of the heart, "since they are common to many other affections, and particularly to almost every chronic disease of the lungs." There is much truth in this observation; but I apprehend, nevertheless, that the uncertainty of the diagnosis, founded merely on the symptoms, is not in general so great as might appear from the sentiments expressed by Laennec. When we find a patient complain of more or less habitual dyspnœa, greatly aggravated on corporeal exertion; slight œdema of the feet; a puffy and anxious appearance of the countenance, with a livid hue of the prolabia; frequent palpitations or tumultuous action of the heart; an inexpressible feeling of anxiety in the region of the heart during the paroxysms of dyspnœa; the occasional sudden occurrence of elastic puffy swelling of the lower eyelids and the upper lip; an irascible and gloomy temper; quick and short inspirations; a deep purple and bloated aspect of the face during the paroxysms of dyspnœa; with an absence of the peculiar wheezing and rattling noise in the lungs; and a free secretion of urine; when these symptoms are noticed, we have strong reasons for presuming that there exists some disease of the heart. The sudden and exceedingly distressing

effects that arise from bodily exertions in diseases of the heart, are often sufficiently characteristic to distinguish them from simple hydrothorax. Every muscular effort, or unusual exercise, aggravates to an extreme degree the dyspnœa and distressing anxiety and agitation in organic cardiac diseases. Going up stairs or walking up a rising ground almost immediately excites the most alarming and suffocative paroxysms of dyspnœa. Although these causes also aggravate, in some degree, the difficulty of breathing in simple hydrothorax, yet these consequences are by no means so violent and agitating in this disease as in the affections of the heart. Without doubt, however, *mediate auscultation* affords the most certain means for recognizing the presence of organic cardiac diseases; but the tact for profiting by this diagnostic test can only be acquired after a long course of careful experience; and it must, moreover, be observed, that even in the most experienced hands, the stethoscope more frequently gives fallacious indications with regard to the affections of the heart, "than in any of the other diseases which it is calculated to discover." (Laennec.)

Prognosis.—In general, the prognosis in diseases of the heart is particularly unfavorable. Nevertheless, much relief may sometimes be procured even in cases of great severity. We "sometimes," says Laennec, "see the judicious combination of blood-letting, diuretics, and tonics, remove the impending suffocation, the palpitation, and the dropsy, and restore the patient frequently for a long period to a tolerable degree of health: and it is commonly only after a great many attacks recurring after considerable intervals, that the disease at length proves fatal."

Death almost always occurs very suddenly, and not unfrequently when the patient seems to be free from any unusual disturbance from the disease. Indeed the mere degree of severity of the symptoms is often very fallacious in a prognostic point of view. In some instances, much continued uneasiness, with frequent exacerbations of distressing violence, will continue for many years before the disease terminates in death. In other cases, with less structural disorder of the heart, and no very severe symptoms, the disease will unexpectedly terminate fatally in a short period after the first manifestations of its presence. Dilatation and attenuation of the parietes of the ventricles; hypertrophy with softness of the muscular structure; and contraction or diminution of the openings of the heart, appear to be most apt to prove suddenly and unexpectedly fatal. The occurrence of other diseases in persons laboring under organic affections of the heart, always enhances the liability to a speedy unfortunate termination very considerably. Pregnancy, parturition, intermitting fever, &c., are especially calculated to increase the sufferings and dangers of structural cardiac affections. In some instances, diseases of this kind give rise to a protracted state of asphyxia, and cases of spontaneous resuscitation have occurred after the patient had been supposed to be dead.

Forms of structural cardiac disease.—A great variety of organic affections of the heart, and its immediate appendages, are mentioned in the works on this subject. The following are the principal forms of these diseases: 1. Thickening and enlargement of the heart, or hypertrophy; 2. Attenuation of the parietes of the ventricles; 3. A morbid softness and flabby state of the structure of the heart; 4. Dilatation of its cavities; 5. Aneurismal pouches of its ventricles; 6. Ossifications of the valves, and other parts; 7. Excrescences of a warty character on the valves, and from the internal surface of the ventricles; 8. Contraction of the openings of the heart; 9. Absence of laceration, or ulcerative destruction of the valves; 10. Adhesions between the pericardium and the heart; 11. Tumors on the heart, pericardium, or aorta; and 12. Polypous excrescences. Of these affections, the severest and most common are: dilatation of the ventricles; hypertrophy, or enlargement and thickening of the parietes, or the connection of both these conditions. The following observations on these affections are drawn from M. Laennec's work on the diseases of the chest.

1. *Hypertrophy of the Heart.*

The term hypertrophy is employed to designate an unnatural thickening or increase of the muscular structure of the heart, without a proportionate dilatation, though frequently with considerable diminution of its cavities. (Laennec.) In general this thickening is at the same time attended with an *increased firmness* of the structure of the heart; but it is also sometimes found connected with a morbid *softening* of its substance, though the latter condition appears to be the consequence of a distinct disease, as it frequently exists independently of hypertrophy. In some cases, the hypertrophy is confined to a single ventricle; sometimes both ventricles are affected, with or without a similar condition of the auricles; and occasionally, though very rarely, the auricles alone are found in a state of hypertrophy.* M. Laennec states that he has seen the walls of the left ventricle more than an inch thick, and even as much as eighteen lines at the base. The thickening generally "diminishes gradually from the base to the apex. The columnæ carneæ of the ventricles, and the pillars of the valves, acquire a proportionate enlargement, and the septum between the two ventricles becomes also considerably thickened in the disease of the left ventricle." In many instances the cavity of the ventricles is diminished in size. Laennec has found the left ventricle so small in hypertrophy as "scarcely to be capable of containing an almond with its shell."

The *symptoms of hypertrophy of the left ventricle are:* A strong and full pulse; violent beating of the heart against the chest: and a violet or red tint of the face. The patient almost constantly *feels* the action of the heart; though very violent and tumultuous palpitations are less apt to occur in this than in some other affections of the heart. These symptoms, though frequently present, are not invariably so; for in some very severe cases, the pulse is small and weak. The signs furnished by immediate auscultation, however, in connection with the state of the pulse, and the appearance of the countenance, will in general enable us to recognize the presence of this affection. Between the fifth and sixth cartilages of the ribs, the heart "gives a very strong impulse, and is accompanied by a duller sound than natural, and prolonged in proportion as the thickening is more considerable. The contraction of the auricle is very short, productive of little sound, and consequently scarcely perceptible in extreme cases. The sound of the pulsation of the heart is confined to a small extent, being in general scarcely perceptible under the left clavicle, or at the top of the sternum; sometimes it is confined to the point between the cartilages of the fifth and seventh ribs; and the impulse of the heart is rarely perceived beyond the same limits except during palpitation."

Laennec, Bertin, Richerand, and others, consider simple hypertrophy of the left ventricle as peculiarly apt to produce apoplexy; but Dr. Kelly has very ingeniously, though certainly not satisfactorily, controverted this opinion.

When the right ventricle is in a state of hypertrophy, there is more dyspnœa and the countenance is of a deeper hue, and in nearly all instances the external jugular veins are turgid, and have a manifest pulsating action communicated to them by the regurgitation of the blood. Laennec states that he has never found this symptom absent in hypertrophy of the *right* ventricle. The stethoscope gives the same results as when the left side is affected, with the exception that the heart is felt beating with most force at the *bottom of the sternum*, instead of the space between the cartilages of the fifth and sixth ribs. Laennec asserts, that the place where the action of the heart is most distinctly felt, may be regarded as a certain diagnostic in relation to this subject. When the hypertrophy exists in both ventricles, "the signs consist in a reunion of those that belong to hypertrophy of each side; but those of the right side are almost always more marked."

* Laennec.

2. *Dilatation of the Ventricles.*

This constitutes the *passive aneurism of the heart* of Corvisart—the ventricles being preternaturally dilated, their parietes attenuated, and the muscular structure, in many instances, so soft that it may be readily broken down by mere pressure between the fingers. The walls of the left ventricle have been found so thin as to measure scarcely two lines at the thickest part, and not more than half a line at the apex; while the right ventricle is sometimes so completely extenuated as to appear merely composed of a little fat and its investing membrane." Though sometimes confined to one ventricle, dilatation usually affects both at the same time. This condition of the heart is very commonly accompanied by other organic affections of this organ—particularly ossification of the valves, and congenital narrowness of the openings into the aorta or pulmonary artery; and Bertin thinks that the morbid dilatation is always *caused* by these and other circumstances capable of impeding the free course of the blood as it is thrown out by the ventricles. This appears to be the most common of all the organic cardiac diseases, and seems generally to be produced in a very gradual manner.

In dilatation of the ventricles, the pulse is usually soft and weak, and the palpitations of the heart feeble and indistinct. Mr. Forbes thinks that pain, or a peculiar feeling of distress in the region of the heart, extending sometimes to the top of the sternum, between the shoulders and the left arm, as in angina pectoris, deserve notice as signs of dilatation of the heart. He refers also to headache, an affection which he thinks "he can trace in a great number of cases to this condition of the heart as its exciting cause." When the *left* ventricle alone is thus affected, the contractions of the heart will be heard very distinctly with a clear and sonorous sound between the cartilages of the fifth and seventh ribs, through the medium of the stethoscope; and "the degree of distinctness of the sound, and its extent over the chest, are the measure of the dilatation. Thus when the sound of the contraction of the ventricles is as clear as that of the contraction of the auricle, and if it is, at the same time, perceptible on the right side of the back, the dilatation is extreme." (Laennec.) When the *right* ventricle is in a state of morbid dilatation, the pulse and action of the heart "are nearly the same as in dilatation of the left ventricle." In general the jugulars are distended; the oppression in the chest is apt to be great; anasarcous effusions occur; the countenance is usually livid, and bloody expectoration is very common. Laennec states that an habitual turgid state of the jugulars, unattended with a pulsatory motion, is the most constant and characteristic "of the *equivocal* signs of this affection. The only constant and truly pathognomonic sign is the loud sound of the heart, perceived under the lower part of the sternum, and between the cartilages of the fifth and seventh ribs of the right side. The palpitations which accompany this affection consist principally in an increase of the frequency and sound of the contractions, while at the same time, the impulse of the heart's action is frequently feebler than in the ordinary state of the patient. Laennec places but little reliance on percussion, as a means of forming a diagnosis in cases of this kind. In general, percussion at the bottom of the sternum elicits a dull sound.

Dilatation with hypertrophy of the ventricles, is much more common than either of these affections separately, and may exist in one or both ventricles. The contractions of the ventricles in this affection may be very distinctly felt by the hand; "and if we attentively observe the patient, we frequently perceive the head, limbs, and even the bed-clothes, strongly shaken at each systole of the heart. If we press on the region of the heart, this organ seems to be irritated by the pressure, and beats more forcibly still." The pulse is full, hard, strong, frequent, and vibrating; the pulsation of the superficial arteries are often visible. Percussion on the region of the heart almost always elicts a dull and obscure sound. With the stethoscope, the pulsations of the heart are heard distinctly

over a great extent—they may be perceived below the clavicles, on the sides, and a little to the left side of the spine. In some instances, when the heart palpitates strongly, besides the impulse of the heart, which seems communicated by a large surface, we can distinguish another shock which is sharper, clearer, and shorter, although occurring at the same time, and which seems to strike the walls of the chest with much smaller surface. This blow seems evidently occasioned by the apex of the heart.

3. *Aneurism of the Aorta.*

Aneurismal dilatations of the aorta are very common. In some instances the dilatation exists without rupture of any of the arterial coats, constituting what authors call *true* aneurism; in others, the internal coat is ruptured, forming the kind of arterial dilatation denominated *false* aneurism. Sometimes a large extent of the aorta is in a state of morbid dilatation; but much more commonly the dilatation is confined to the ascending portion and arch. These aneurismal tumors often acquire a very large size. Laennec has seen them "as large as the head of a full grown fœtus." By compressing the heart and lungs, these tumors are apt to give rise to very alarming and distressing affections. When the coats of the artery are much diseased, or the dilatation becomes very great, the tumor sometimes bursts and causes immediate death. In some cases the "aneurism compresses the trachea, or one of the two bronchial tubes; flattens and eventually destroys a part of them, and death ensues from the rupture of the tumor." The œsophagus may also be thus compressed, but this occurs but seldom. The heart is usually pushed to one side or downwards. Sometimes the aneurism bursts into the air-cells of the lungs; but rupture into the left cavity of the pleura is by far the most common. Aneurismal tumors of the aorta often destroy the vertebral column to a great depth, by causing gradual absorption without leaving any other marks of disease, such as caries, &c. When this takes place, the tumor becomes entirely destroyed on the side next the vertebræ—the naked bone forming the posterior wall of the sac. The sternum is also in some cases destroyed, when the aneurism is in the ascending aorta. When the arch of the aorta or the arteria innominata is the seat of the aneurism, the tumor often projects at the top of the sternum, or under the cartilages of the first false ribs of the right side. It is not always the largest aneurisms that most readily make their way externally. Sometimes those of the size of an egg produce this effect, whilst occasionally, those of the size of the head of a full grown fœtus remain quite covered, and even compressed by the sternum. (Laennec.)

Diagnosis.—The signs of aneurism of the aorta, according to Corvisart, are: inequality of the pulse in both arms; obscure sound on percussion; a rattling noise in the throat, "and dragging downwards of the larynx when the tumor presses upon the trachea; and a whizzing or rushing at the top of the sternum perceptible by the hand." Laennec, however, places no reliance on these signs, and observes that aneurism of the aorta has no symptoms peculiar to it—the symptoms just noticed "being indicative merely of the change or compression of the adjoining organs." If, however, we find under the sternum or below the right clavicle, the impulse of the circulatory organ isochronous with the pulse, and perceptibly greater than that of the ventricles examined in the region of the heart, we have reason to suspect dilatation of the ascending aorta or arch—the more so as it is extremely rare to feel the impulse of the organ of the circulation beyond the region of the heart, even in cases of the most marked hypertrophy. If this phenomena is found constant after repeated examinations, we may consider the diagnosis as certain. Examined with the stethoscope, the aneurismal tumor usually elicits a peculiar purring thrill, and bellows-like sound. In general, however, aneurism of the aorta can only be recognized with certainty when it shows itself externally; but even when it passes through the walls of the chest, "it is not always distinguishable from other tumors. The origin and progress of this

affection are, indeed, sometimes so obscure as scarcely to give any reason for suspecting its existence;" and the first indication of its presence is often the death of the individual as instantaneously as if by a pistol-bullet.

Treatment of the Organic Diseases of the Heart.

The greater number of organic diseases of the heart must be regarded as absolutely incurable. This, however, does not apply to hypertrophy and dilatation, whether existing singly or concomitantly with each other; for by a judicious and energetic course of treatment, both these cardiac affections may occasionally be entirely removed, and almost invariably greatly mitigated. M. Laennec observes that "the greater number of practitioners are too much in the habit of despairing of success in cases of this kind, and therefore content themselves with attacking such urgent symptoms as may arise in its progress; and yet, I believe, there is no one who has not succeeded every now and then, even by this symptomatizing treatment, in prolonging for fifteen or twenty years the lives of individuals affected with organic diseases of the heart." Organic affections of the heart are, indeed, much more generally regarded as mere subjects of pathological speculation than as diseases, in some instances at least, susceptible of cure or melioration by proper remedial management. "We think such an estimate," says Dr. Johnson, "not only a false one, but pernicious in its consequences both to the patient and practitioner."

The general and paramount indication in the treatment of organic cardiac affections—more especially of hypertrophy and morbid dilatation, is *to reduce and keep down uninterruptedly the momentum of the circulation;* and this is to be fulfilled by lessening the mass of the blood by venesection, and a reduction in the quantity and nutrient qualities of the food, and by carefully avoiding everything which has a tendency to increase the action of the heart and arteries. When there is reason to believe that there exists hypertrophy, the volume of the circulating fluid should be at once decisively diminished by as large a blood-letting, "as the patient can bear without fainting;" and this is to be repeated at intervals of three or four days, until the "palpitations have ceased, and the heart yields up a moderate impulse under the stethoscope." In cases where there is simple dilatation, without an increased thickness of the muscular structures of the ventricles, the abstractions of blood can scarcely be carried to a very great extent, or at least be very frequently repeated, without the risk of great prostration, or fatal syncope. In cases of this kind, it will nevertheless be highly proper to keep down the mass of the blood; but after one or two effectual bleedings this may be most prudently done by an extremely abstemious mode of living.

A reduction of the ordinary quantity of food is indispensable to full success in cases of this kind. The good effects of blood-letting will be but temporary, and in general wholly inadequate, unless the rapid generation of new blood be at the same time obviated, by putting the patient on a very spare and diminished allowance of diet. Laennec advises that the food should be diminished to one-half at least of the ordinary quantity taken by the patient; and it should consist of mild and unirritating articles of diet, at the same time that the mass of the blood is kept down by repeated bleedings. All kinds of stimulating liquids must be rigidly forbidden. This course of depletion and low diet must be steadfastly pursued, the patient at the same time avoiding, as much as possible, everything which may cause inordinate excitement of the circulatory system, particularly exercise, strong mental emotions, and stimulating ingestion. "When the patient has been two months without experiencing palpitations, and without increased impulse of the heart, we may lessen the frequency of the bleedings, and diminish in some degree the severity of the regimen, if the patient is not at all habituated to, or satisfied with his allowance. But we must return to the same means, and with the same rigor, if the augmented impulse of the heart should return." (Laennec.) This method of treating organic affections of the heart was first practiced by

Valsalva and Albertine.* In addition, however, to the foregoing measures, they kept their patients in bed during a period of forty days, and directed the frequent use of laxative enemata. Dr. Forbes states that he has resorted to this method of treatment with much temporary advantage, and he cites the names of Lancici, Guattini, Sabatier, Pelletan, Corvisart, Hodgson, Bertin, and others, in favor of its usefulness in organic cardiac affections. Morgagni also speaks of this reducing plan of treatment in affections of this kind with decided approbation;† and there can be no doubt, indeed, of its direct tendency to lessen the violence of the symptoms, or to effect a cure in hypertrophy of the heart. Laennec observes, that even where the disease has advanced so far as to have induced great dyspnœa, anasarca, and a general cachectic state of the system, "we must nevertheless fearlessly prosecute the plan of starvation and bleeding."

When the symptoms just mentioned, namely, habitual dyspnœa and dropsical effusions occur, *diuretics* will generally assist materially in alleviating the sufferings of the patient. Dropsical effusions into the cavity of the pleura or pericardium, almost invariably occur in the progress of organic affections of the heart, and it would appear that the immediate cause of death in many instances are effusions of this kind, impeding the actions of the lungs and heart. Diuretics can therefore rarely be dispensed with in affections of this kind, and they are in fact often decidedly palliative. We may frequently succeed in removing the dropsical effusions from the chest, by the judicious employment of this class of remedies, so as to procure much temporary relief. The effusion, it is true, will generally soon return again, but I have known the life of an individual protracted for four or five years, by occasionally effecting a removal of the dropsical accumulation. I attended an old lady some years ago who labored under symptoms of hydrothorax; by low diet and the use of the squill and nitre, in doses of about two grains of the former to fifteen of the latter, I succeeded in removing the water from her chest three times in the course of about fifteen months. She finally died suddenly, and on dissection, the heart was not only in a state of remarkable hypertrophy, but the mitral valves were completely ossified. Some writers have strongly recommended digitalis as a diuretic in organic cardiac affections, attended with dropsical effusions; and from the known powers of this article to curb the action of the heart, it would seem to be peculiarly applicable in cases of this kind. Laennec, nevertheless, does not speak very favorably of its powers in the class of diseases now under consideration. He observes, that he has never found it to control the action of the heart, "even when the dose was carried to the extent of producing vomiting and vertigo." Its diuretic powers are equally uncertain, but of its occasional sedative, as well as diuretic influence, no doubt can be entertained, and as both these effects are peculiarly desirable in cases of this kind, it unquestionably deserves a fair trial, where we find other articles inefficient. I have known the infusion of the erigeron heterophyllum to produce very active diuresis, and of course advantage, in one instance of cardiac disease accompanied by hydrothorax.

Purgatives may also be resorted to with advantage, where the dropsical accumulations become considerable in cardiac affections; and they are more especially necessary where diuretics fail to procure relief. One of the best medicines for this purpose is the following combination, which rarely fails to procure copious watery discharges from the bowels, and at the same time free diuresis.‡

When the cardiac affection consists in *simple dilatation*, the pulse, as has already been stated, is generally feeble and compressible, and the depletory measures must therefore be employed with caution. But even in cases of this kind

* Morgagni. De Sedibus et Causis Morbor., &c. Epistol. xvii. art. 3.

† Loc. citat. Epistol. xviii. art. 30.

‡ ℞.—Tart. potass. ℥iss.
Sulph. potass. ℥ss.
Pulv. scillæ ʒii.
Tart. antimonii grs. ii.—M. S. Take a teaspoonful four or five times daily.

we must endeavor to obviate a plethoric state of the vessels, by an occasional small blood-letting and an abstemious diet. The principal remedies here are the ferruginous preparations and the vegetable bitters. These may be beneficially given in union with some of the milder aromatic substances, particularly the infusions of valerian, cat-mint, and of orange flowers. (Laennec). To curb the action of the heart, digitalis is particularly useful in instances of this kind.—From one-fourth to half a grain of the powder of this vegetable may be given every two hours until the frequency of the pulse is moderated, and it should be repeated afterwards in such a way as to keep up a slight sedative impression on the circulatory system. Cases of mere dilatation, however, are seldom permanently benefited by remedial treatment; and the prospect of effecting an entire cure is always exceedingly small. By the employment of chalybeate waters, or some of the officinal preparations of iron, and weak infusions of the tonic vegetable bitters, and a simple and abstemious course of living, with a careful avoidance of all unusual corporeal exertions and spirituous potations, a considerable degree of comfort may be obtained by patients affected in this manner.*

Baron Larrey, in his recent work,† has related some cases, from which it would appear that *counter-irritation by means of moxa* is capable of doing much good in dilatation and enlargement of the heart. He insists upon it, in opposition to Corvisart and others, that hypertrophy cannot be removed by the most rigorous system of depletion. He assures us, however, that during a period of more than thirty years, he has had frequent opportunities of witnessing the beneficial effects of counter-irritation. Adopting the opinion that in organic affections of the heart, the remote cause almost always consists in "some morbific principle, whether syphilitic, scrofulous, herpetic, or otherwise," he lays down two indications to be pursued in the treatment of these cardiac affections, namely, to counteract or destroy the primary specific cause, by specific remedies; and draw off the irritation from the heart, by establishing an external counter-irritation by means of moxa. Against the supposed specific cause he employs mercurial remedies, and he avers that these are always highly beneficial when combined with counter-irritation.—In active hypertrophy he uses local depletion over the cardiac region, after which he applies the moxas. He speaks also very favorably of cold in the form of ice applied to the region of the heart. The moxas are to be applied first to the track of the intercostal nerves behind the left hypochondrium, and then gradually brought round and forwards to the anterior cardiac region. His favorite formula for administering the mercurial remedies is the following:

℞.—Muriat. hydrarg. corros.
Muriat. ammon.
G. opii, ää grs. v.
Aq. destillat. lbi.
Misce ft. solutio. Of this, a dessertspoonful is to be taken several times, we presume, daily, for he does not state the frequency of the dose.

"One great principle," says Dr. Forbes, "is always to be kept in view, in the treatment of diseases of the heart, namely, the removal of all disorders in other organs which can act as a source of irritation to the heart." It is particularly important to attend to the gastric and hepatic functions; and hence we find that patients almost always experience some relief when these functions are brought into a healthy condition. "I would lay it down," says the writer just quoted,

* [By a long perseverance in the general course of treatment described by our author, I have witnessed apparent cures of several cases of hypertrophia of the heart. Certainly I have succeeded in the cure of three cases of aneurism of the ascending aorta even after the tumors had begun to protrude externally through the cartilages of the ribs, on the right side, in two cases, and at the top of the chest, through the sternum and right clavicle, in the other. The blood gradually became coagulated within the sacs in all these cases, and finally confined the current of circulation within its natural channel. The solid tumor which resulted was by degrees reabsorbed in each of these cases, and the patients lived for years afterwards engaged in active employment.—Mc.]

† Clinique Chirurgicale.

"as a general rule in chronic affections of the heart, that previously to having recourse to any remedies intended to act directly on it, we ought to be assured that the digestive organs are in a healthy state—that their mucous surfaces are free from irritation—their vascular system not morbidly distended, and that the liver is performing the secretory functions freely and regularly. When derangements of this kind are present—a few leeches to the præcordia or anus, some small doses of oxyde of mercury and castor oil, a mild and spare diet, and bodily and mental repose, will often do more to tranquilize the circulation than more active and rougher means. *And, indeed, in many cases, more especially in the earlier stages, when the stethoscope gives but little information, it is not until we have restored the organs to a comparatively healthy condition, that we can know how far the disordered action of the heart depends on sympathy with these, or is the consequence of incipient organic lesion of the heart.*"* Concomitantly with the employment of the above-mentioned tonics, very considerable advantage may in general be derived from an occasional dose of three or four grains of blue pill at night, and a mild laxative in the morning; and to keep up the regular action of the skin, the *tepid* shower-bath will generally be useful.

Sympathetic Affections of the Heart.

Symptoms differing in no material circumstance from those which have already been mentioned as belonging to *organic* affections of the heart, are not unfrequently the result purely of a sympathetic irritation of this organ without any structural lesion whatever. I do not now allude to those cases of *angina pectoris* which arise from metastatic or sympathetic irritation, and which are probably always of a strictly neuralgic character. The heart is liable to be excited into vehement and tumultuous action, by a variety of causes not immediately connected with lesion or disorder of its structure; and the most alarming instances of this kind often result from an irritation located in some remote part of the system. It is of much consequence, in a practical point of view, to keep this, indeed, well-known fact in mind, in prescribing for cardiac affections. I have, in several instances, been consulted by persons subject to extremely violent paroxysms of *palpitation*, who were supposed to be laboring under chronic affection of the heart, and who were completely relieved by a course of treatment calculated to restore the healthy condition of the digestive functions and of the liver. When we find paroxysms of palpitation come on while the patient is quiet, perhaps lying down, without pain in the region of the heart, at the same time that there are symptoms of indigestion, particularly eructations of flatus, there can be but little doubt that the cardiac affection is symptomatic of gastric irritation. Habitual debility and irritation in the digestive organs are particularly apt to give rise to such affections in persons of a plethoric and nervous habit of body. I was consulted, about eighteen months ago, by a gentleman of a very nervous temperament and weak digestive powers, for aid, in what he was led to regard as a local affection of the heart. The slightest mental agitation would, occasionally, immediately excite vehement palpitations; and frequently similar paroxysms came on about two hours after taking his meals. He had paid little or no attention to the regulation of his diet, although often disturbed with flatulency, acidity, and other unpleasant sensations in the stomach. He was directed to take four grains of blue pill every other evening, an occasional dose of rhubarb in the morning, and put on a light and digestible diet, with exercise on horseback. In four weeks his complaint left him, and he has not had any return of it since.

Irritation located in other organs, as the kidneys, intestinal canal, uterus, liver, and probably the spleen, sometimes gives rise to severe fits of palpitation. They are particularly apt to occur about the age of puberty in young females, or just before the eruption of the menses. Nervous females, more especially those who

* Laennec on the Chest, by Dr. Forbes.

labor under chronic hysteric affections, are also especially subject to palpitations of the heart. These cases are in general easily distinguished from organic affections of the heart, but as structural disease of this organ may be associated with mere sympathetic irritation, it may be well to state more explicitly the signs by which *nervous* palpitation may be distinguished from hypertrophy or dilatation of the heart.

Violent and extremely alarming cases of cardiac disease, unconnected with organic lesion, sometimes result from the unnatural and enervating practice of *onanism*. I have met with a most deplorable instance of this kind, in a young man, which was finally removed by discontinuing this degrading habit, in conjunction with mild tonics, active exercise, and a regular, digestible, and nourishing diet. Dr. Krimer has, within a few years past, published several remarkable cases, illustrating the injurious effects of self-pollution on the heart. The usual symptoms in cases of this kind, are: pale and dejected countenance; eyes sunken and haggard; taciturnity or pusillanimity; general languor of the body, and mental apathy; more or less tenderness in the epigastrium; and irregular action of the heart, with frequent paroxysms of tumultuous palpitation, dyspnœa, and præcordial anxiety.*

As the subject is one of great importance, I subjoin the following observations from Dr. Krimer's paper, as diagnostic of cardiac affections arising from onanism. The hair is dry, not glossy, split at the extremities, and apt to fall off, especially from the fore part of the head. The eyes dull, sunken, watery, and apathetic; the edges of the lids are often red, and the lower margin of the orbit surrounded with a bluish streak; the countenance is unsettled, timid, and the patient "cannot bear the steadfast gaze of another person." There is often headache, which returns, in most instances, at nearly the same time daily—the pain of which radiates from the occipital to the frontal region. Vision is, at times, confused or dim; the appetite weak and capricious; the tongue lightly covered with white fur; and the breathing is usually short. *Pain in the stomach* is almost continually present, and the epigastrium is extremely tender to pressure "*without any other symptoms of mucous inflammation of the stomach.*" Great lassitude with pain in the loins and lower extremities, are very common symptoms. There is often a considerable drowsiness, and always a remarkable disinclination to mental and corporeal action.†

"In nervous palpitation, the first impression conveyed by the stethoscope is, that the heart is not enlarged. The sound, though clear, is not heard loudly over a great extent of the chest; and the impulse, though appearing considerable at first, is really not great, as it never sensibly elevates the head of the observer. This last sign seems to me the most important and certain of any, when taken in conjunction with the frequency of the pulsations. These are always quicker than natural, being most frequently from eighty-four to ninety-six in the minute. Nervous palpitations are rarely accompanied by any sign of determination of blood to the head or chest, except in old persons. A feeling of internal agitation, particularly in the head and abdomen, always accompanies nervous palpitation; and the urine is generally limpid and watery." (Laennec.)

Treatment.—The treatment must of course be regulated according to the particular condition of the general system, and the local organic irritations that may exist. The digestive functions must be particularly attended to, and the sources of intestinal irritation obviated by gentle aperients. In relaxed and weak habits, the tepid bath; a mild, digestible, and nutritious diet; gentle tonics, especially

* The reviewer of Dr. Krimer's paper observes: "The disgusting nature of the subject has prevented English writers from any description or investigation of the phenomena; but we are well convinced, from many cases which have presented themselves to our observation, and where the cause has been voluntarily confessed, or unexpectedly drawn forth, that a great number of cardiac affections, as well as anomalous symptoms of disorder in other parts of the system, are owing to this destructive vice"—*Med.-Chir. Rev.*, April 1828, p 149.

† Hufeland's Journal der Heilkunde, Jan. 1827.

bitters and iron, gentle exercise by gestation; and in young and plethoric subjects, small abstractions of blood, warm pediluvium, and digitalis, will, in general, prove beneficial. Antispasmodics very rarely procure any relief, and indeed much more frequently do injury. Although small portions of blood may sometimes be beneficially abstracted in robust and plethoric subjects, yet blood-letting, to any considerable extent, is generally detrimental, in the sympathetic affections of the heart. I have met with several instances, where repeated abstractions of blood had reduced the patients to the most deplorable condition; and which were afterwards cured by tonics, gentle exercise by gestation, the tepid shower-bath, and a digestible and nourishing diet. One young man, of a dyspeptic habit, was affected at times with alarming palpitation, and dyspnœa. His physician, regarding it as active hypertrophy, bled him copiously. The disease, however, gradually became more distressing, and the blood-letting was repeated from time to time. Finally the patient was obliged to remain in his room, and could not walk across the floor without bringing on a violent paroxysm of palpitation and præcordial distress. A consultation was called, and the plan of treatment changed. Mild tonics, dry frictions of the extremities, the tepid shower-bath, a nourishing, but light and digestible diet, were ordered. In a few weeks he could leave his room; soon was able to take exercise in a carriage, and in about three months had his health perfectly restored. Physicians are too apt to resort to the lancet when they find the heart in a state of tumultuous action. The minutest inquiry into the origin and character of the disease should always be instituted before this practice is adopted; and where there is reason to believe that the cardiac disorder is the result of a sympathetic irritation, blood should not be extracted unless some especial indications exist for the reduction of the mass of the circulating fluid. When sympathetic disease of the heart is intimately connected with general plethora, which is, indeed, frequently the case, it may be proper to practice one bleeding in the commencement of the treatment; but even in cases of this kind I should prefer reducing the volume of the blood by a more spare diet and the encouragement of the ordinary secretions, particularly those of the skin and kidneys.

Sect. II.—*Angina Pectoris.**

Angina Pectoris was not noticed as a distinct disease until the attention of the profession was directed to it by Dr. Heberden, in a very perspicuous and full account of its peculiar character, published in the second volume of the *Medical Transactions of the London College of Physicians.* Since that time it has been frequently and minutely described; and of late years, especially, its phenomena and pathology have received much attention.

This disease consists of sudden paroxysms of pain and pressure at the lower part of the sternum, or about the region of the heart, extending across the breast to the left shoulder, and to the arm as low as the insertion of the deltoid muscle, or the elbow, or even to the fingers; accompanied with some difficulty of breathing, great anxiety, and a sense of impending suffocation.

The attack usually commences without any premonitions of its approach, by sudden pain and constriction in the left side of the chest, or near the scrobiculus cordis, and a peculiar numbness with more or less pain in the left arm, particularly on the inside, as low as the elbow. If the paroxysm comes on while the patient is walking, he is instantly obliged to stand still. The least exertion gives rise to intense darting and constrictive pain in the cardiac region, and the patient

* This disease has been described under a great variety of names, as *asthma convulsium*, by Elsner; *arthritis diaphragmatica*, by Butler; *syncope anginosa*, by Parry; *asthma spastico arthriticum inconstans*, by Stoeller; *strenalgia*, by Baumes; *sthenocardia*, by Breta; *asthma dolorificum*, by Darwin; *sternodynia syncoptica et palpitante*, by Sluis; *pnigophobia*, by Swediaur; and *cardodyne spasmodica*, by Harles.

feels as if an attempt to move would inevitably cause immediate death. During the paroxysm the countenance is pale and expressive of great anguish, the extremities are cold, the heart palpitates violently, there is more or less dyspnœa, turgidity of the vessels of the head, and in some instances syncope, and even convulsions, ensue. Sometimes the pain passes up along the neck and face, or back to the spine, with a sense of retraction at the lower end of the sternum; and occasionally it is felt in both arms at once. At first the paroxysms last but a few minutes, and recur at remote intervals, generally in walking up hill, or rapidly ascending stairs soon after taking a full meal. By repetition, however, they become more and more violent and protracted, and return, in aggravated instances, on the slightest bodily exertion. When the attack has passed off the patient usually feels only numbness of the left arm, with some degree of palpitation, and occasionally slight headache, hurried respiration, and anxiety of feeling in the præcordia.

Pathology.—This disease is very rarely met with in young people; and it occurs, indeed, but seldom in individuals under forty years of age. I have, nevertheless, seen a well-marked case in a young man of an arthritic habit, who was not more than twenty-three years old; and I am now attending a girl under eleven years of age, who is occasionally seized with paroxysms which appear to me genuine instances of this affection.*

The majority of cases of angina pectoris occur in individuals of a gouty or rheumatic habit. Jahn states, that in the summer of 1814 he met with several instances of this disease, which supervened apparently as sequelæ of typhus fever.†

In relation to the immediate or exciting causes of this affection, pathologists have expressed very different opinions. Heberden, Kreysig‡ and Parry§ attributed the disease to ossification of the coronary arteries, and this opinion is still entertained by many physicians. Others have ascribed it to ossification of the semilunar valves of the heart; and various other organic affections of this organ and of the adjoining parts have been mentioned as its cause, such as morbid dilatation and softening of its structure; ossification of the cartilaginous portion of the ribs; suppurative inflammation of the mediastinum, and disease of the pericardium. That no one of these morbid conditions, however, can be regarded as the proximate or essential cause of angina pectoris, is evident from the fact, that in many fatal instances of the disease, no such structural disorders are discovered on post-mortem examination.‖ M. Récamier, principal physician at the Hotel Dieu, has never witnessed an instance of ossification of the coronary arteries in the bodies of those who have died of angina pectoris; and he wholly rejects the idea of its depending on organic cardiac disease.¶ M. Laennec, also, denies the necessary connection between organic affections of the heart and angina pectoris. "In a slight and middling degree," he says, "this disease is very common, and exists very frequently in persons who have no organic affection of the heart and large vessels."** It must, moreover, be observed, that ossification of the coronary arteries, and other structural diseases of the heart, are frequently met with in subjects who had never experienced any of the characteristic symp-

* [I once attended a young gentleman of this city, 21 years of age, who had been intemperate in his habits, and subject also to inflammatory rheumatism which had been translated to his heart, and produced the symptoms of pericarditis. The consequence was the development of a genuine angina pectoris, which came on in frequent and terrible paroxysms, and finally destroyed him on a voyage for the recovery of his health in the Gulf of Mexico.—Mc.]

† Klinik der Chronischen Krankheiten, bd. iv. p. 406.

‡ Die Krankheiten des Herzens, 2 Th., 2 abhand., 5 Kap.

§ Treatise on Syncope, Anginosa, &c.

‖ [An eminent gentleman of the bar in Philadelphia, died some years ago of a paroxysm of this disease, and on a post-mortem inspection I could discover no other signs of organic disease than a small patch of opacity in the serous membrane covering one of the ventricles. He had been subject, in previous years, to regular attacks of gout.—Mc.]

¶ Medico-Chir. Rev., March 1829, p. 573.

** On the Diseases of the Chest, last edition; translated by Dr. Forbes.

toms of angina pectoris. Mr. Cook says, "I have met with numerous instances of ossification in the coronary arteries, which had never been attended with symptoms of angina;* and Mr. Shaw observes, in relation to this subject, that he had often found the coronary arteries like tubes of bone in old people who never had the slightest symptoms of this disease.† The occasional spontaneous removal of the disease, and its susceptibility, in some instances, of being cured, militate also directly against the doctrine of its necessary dependence on organic affections of the heart. Laennec avers that "he has known many individuals who had suffered a few very severe but short attacks of angina pectoris, and had had no further return of it." Dr. Parry, who believed that the disease was always caused by ossification of the coronary arteries, nevertheless mentions a severe case, that was wholly or nearly cured by the use of the Bath waters. Dr. Baillie also met with two patients affected with symptoms "exactly resembling those of angina pectoris, who ultimately recovered entirely."‡

Unquestionably, however, ossification of the coronary arteries, and other organic cardiac affections, are very frequently connected with angina; "but nothing proves, even in such cases," says Laennec, "that the disease depends on affections of this kind, inasmuch as they are of various kinds, and as the angina exists without them."

A *softened structure*, or flabby and dilated state of the heart, is almost as common in this affection as ossification of the coronaries. In a most severe case, which was seen by Dr. Latham, Dr. Bree, and Dr. Johnson, the heart on dissection was found "pale, flabby, and so lacerable as to be easily mashed between the fingers like wetted paper or putrid meat."§ Dr. Johnson states, that in all the cases which occurred in his own practice, where post-mortem examination was made, there was a flabby and softened state of the muscular structure of the heart, connected in a few instances with ossification of the coronary arteries.‖ Dr. Cook also mentions a peculiar flaccidity and softness of the structure of the heart, "as a phenomena usually found after this disease," sometimes with, and at others without the ossification of the coronaries or cardiac valves.¶ Hypertrophy or dilatation of the heart, without any other organic disorder, is mentioned by Laennec as no uncommon condition in this affection. About six years ago I attended a gentleman in consultation with Dr. M'Clellan, who was frequently affected with violent paroxysms of angina pectoris. In one of the attacks he suddenly expired. On dissection, the heart was found very large, and its structure so soft as to be easily broken down by pressure between the fingers.

From these facts, it appears evident that organic affections of this kind are to be regarded rather as the *exciting* than as the essential and proximate cause of the disease. It is now believed by many that *angina pectoris* consists *in a neuralgic affection of the heart*, or of the cardiac plexus; and there can, I think, scarcely exist a doubt of the correctness of this opinion. Laennec conceives that the location of the nervous irritation may vary according to circumstances. "For instance," he says, "when there exists at the same time pain in the heart and lungs, we may presume that the affection is principally seated in the pneumogastric nerves; on the other hand, when there is simply a sense of stricture of the heart, without pulmonary pain or much difficulty of breathing, we may consider its seat to be in the nervous filaments which the heart receives from the grand sympathetic. Other nerves are also simultaneously affected, either by sympathy, or from direct anastomosis; for example, the branches of the brachial plexus, particularly the cubital, are almost always so; the anterior thoracic nerves originating in the superficial cervical plexus are also frequently affected; and it is also sometimes the case with the branches derived from the lumbar and sacral

* Treatise on the Digestive Organs, p. 274.
† Manual of Anatomy.
‡ Lectures and Observations on Medicine, p. 185.
§ Med.-Chir. Rev., April 1826, p. 497.
‖ Ibid., March 1828, p. 430.
¶ Loc. cit.

plexuses, as we find the thigh and leg now and then participating in the pain and numbness." M. Récamier also considers this disease as a species of neuralgia; and the same opinion is expressed by Dr. Johnson, Jahn,* Jurin,† Desportes, and other writers.

Mr. Teale refers the various symptoms of angina pectoris to a primary affection of some portion or portions of the spinal marrow, and the corresponding ganglia of the sympathetic. His reasons for adopting this opinion are: 1. The fact that most of the morbid phenomena exhibited in the extreme branches or filaments of nerves, are seldom owing to disease in the nerves themselves, but to an affection of the nervous mass from which they are derived; 2. The tenderness or pain on pressing some portion of the spine, in most cases of angina pectoris; and the correspondence of the tender part of the spine with the particular symptoms which are present—namely, tenderness in the lower dorsal portion of the spine, in conjunction with constriction and other affections of the stomach; and tenderness in the cervical part of the spinal column, with pains in the arms, breast, and shoulders, and palpitations; 3. The relief obtained, by counter-irritating and depletory measures applied to the spine—that is, to the lower dorsal portion, when the stomach is particularly affected, and to the cervical portion, when there are palpitations and affections of the arms, shoulders, &c.‡

Although this neuralgic affection of the heart may often depend on primary spinal irritation, as well as on organic cardiac disease, it may doubtless, also, be excited by other remote causes or irritations of the system. There are some well-authenticated facts on record, exemplifying the occasional dependence of this disease on dyspeptic irritation. I have already adverted to the two cases mentioned by Dr. Baillie, which ultimately recovered, and were evidently dependent "upon an imperfect digestion." Mr. Cook, also, to whose excellent work on the diseases of the digestive organs I have referred above, thinks that angina pectoris is occasionally excited "by derangement of the digestive organs, especially by dyspepsia." Several eminent writers have supposed that the disease depends on gouty irritation;§ and Lentin‖ maintained that it is always of rheumatic origin. This, with some modification, appears, also, to be the opinion of Dr. Chapman; and there can be no doubt that a gouty or arthritic diathesis is often manifestly present, in those who are subject to this alarming cardiac affection. From all that has been ascertained, therefore, in relation to this subject, it would seem that angina pectoris may be excited by various causes, both organic and dynamic, and that it consists essentially in a peculiar irritation of the cardiac nerves, giving rise to pain, and more or less spastic action of the respiratory muscles.

Treatment.—When once fully developed, angina pectoris is an extremely unmanageable affection, and almost always sooner or later terminates in death. It must not, however, be regarded as a hopeless affection, even in its most aggravated form; for instances of complete recovery have occurred, after the disease had continued for several years in occasional paroxysms of great severity.

For the relief of the paroxysm, we may have recourse to small bleedings, anodynes, and antispasmodics. Ether, camphor, opium, hyoscyamus, and the liquor ammoniæ succinatæ, have been most recommended for this purpose. I attended a patient some years ago, who was frequently seized with violent paroxysms of this affection, and who generally obtained considerable relief from a draught of very cold water. This patient died suddenly in one of the attacks; and on dissection, the semilunar valves of the heart were completely ossified.

* Med.-Chir. Rev., Nov. 1828, p. 197.

† Loc. cit, bd. v. p. 407.

‡ A Treatise on Neuralgic Diseases, &c. By Thomas P. Teale, Esq.

§ Berger, Abhandl. f. Pract. Aerzte., b. x. p. 715. Hesse, Specimen Inaugurale Medicum de Angina Pectoris.

‖ Beiträge sur Ausübenden Arzneiwissenschaft, b. i.

Perfect rest need scarcely be enjoined, for patients are irresistibly constrained to remain quiet during the paroxysm. It would appear even that where the patient can summon up sufficient firmness of mind to continue walking when the attack comes on, the exertion has a tendency, in some instances, to mitigate the pain and constricted respiration.* Dr. Good advises that the patient be immediately placed in an inclined position, with the head raised high; and an emetic instantly administered. If the pain and difficulty of respiration continue after the vomiting, "opium intermixed with camphor, ether, or other diffusible antispasmodics, should be freely employed." Emetics were, I believe, first recommended in the paroxysm of this disease by Percival.† Richter admits that much relief may sometimes be obtained from vomits; but he asserts that they may also readily do a great deal of harm. Where the oppression in the chest is great, and the habit robust and plethoric, blood-letting will occasionally afford some relief. According to Laennec, however, leeches applied to the epigastrium or region of the heart, sometimes prove more beneficial than venesection. Indeed, venesection may very readily prove injurious in this complaint, and it ought not to be used, unless the indications for its employment are unequivocal. Dr. Parry, who particularly advocates the practice of venesection in this complaint, advises that the blood "should be taken from a small orifice, the patient being placed in the horizontal position, while the physician is to keep his finger on the pulse, to decide the limits to which venesection is carried." Advantage may also be obtained, during the paroxysm, from *derivative applications*, such as sinapisms to the legs or soles of the feet, and over the epigastrium, and rubefacient frictions to the lower extremities.‡

For preventing the return of the paroxysms, various remedies and modes of treatment have been recommended. As the cardiac irritation may be wholly symptomatic of gastric disorder, it will be proper, in all instances, to pay particular attention to the biliary and digestive functions. A mild diet, the occasional use of small portions of blue pill, chalybeate mineral waters, and tepid or cold bathing, are particularly indicated in cases attended with dyspeptic symptoms. In individuals of a gouty or rheumatic habit, much advantage, it is said, has been obtained from the protracted use of guaiacum.§

Goodwin states that he derived very great advantage from the frequent application of a strong solution of tartar emetic in spirits of camphor;‖ and cases have been published which go to show that the establishment of a permanent drain from the region of the heart, by a seton or issue, may be resorted to with considerable prospect of benefit.¶ Baumes speaks highly of the internal use of phosphoric acid in this complaint; and thinks it capable of arresting the process of ossification;** an opinion which was also entertained by Richter.†† It is given to the amount of a drachm and a half daily in the form of lemonade. In Hufeland's Journal, a writer speaks in the highest terms of praise of the extract of *lactuca virosæ*. Sixteen grains of this extract are to be dissolved in two drachms of cinnamon water, of which fifteen drops must be taken every two hours.‡‡ Arsenic has been used with considerable benefit by Richter; and Smith employed small doses of James's powder in union with castor and assafœtida, with very good effects in some cases of this complaint.§§ The celebrated Odier of Geneva

* Parry's Treatise on Angina Pectoris.

† Medical and Philosoph. Comment., vol. iii. p. 180.

‡ [I have sometimes derived great advantage from cupping between the shoulders and over the epigastrium. In debilitated subjects, dry cupping by the use of common tumblers, exhausted of air by the aid of combustible matters in a state of flame, is the best application.—Mc.]

§ Berger, loc. cit., bd. p. 708.

‖ Annales de Literature Médicale Etrangere, vol. iv. as quoted by Richter.

¶ New York Medical and Physical Journal, Dec. 1814.

** Annales de la Société Pratique de Montpellier, tom. xii.

†† Specielle Thérapie, vol. v. p. 195. ‡‡ Journal, &c., 1809, st. i. p. 57.

§§ Medical Commentaries, Edin., vol. v. p. 78.

restricted his patients to an extremely spare and simple diet, as the best means, in his opinion, for preventing the return of the disease. Laennec asserts that the *magnet* is one of the best means for palliating or preventing the paroxysms of angina pectoris that we possess. He uses it in the following manner: "I apply," he says, "two strongly magnetized steel plates, of a line in thickness and of an oval shape, and bent so as to fit the part, one to the left præcordial region, and the other exactly opposite on the back in such a manner that the magnetic current shall traverse the affected part. This method has succeeded better in my hands in the case of angina than any other, as well in relieving the paroxysm as in keeping it off. After a certain time, the magnetism most commonly produces an eruption of small pimples, which are sometimes so painful as to oblige us to interrupt the process for some days. This eruption almost always takes place under the anterior plate, and cannot, therefore, be attributed to the action of the oxydized pieces of steel on the skin. By means of these plates, applied to the epigastrium and spine, I stopped at once a hiccup which had lasted three years. At the end of six months, the patient having one morning neglected to put on the plates, the hiccup returned, but was removed on their being replaced." When, in angina, the relief obtained from the magnet is but small, its good effects may be increased by previously blistering the part to a small extent, to which the anterior plate is applied.

In the management of this affection, it is all important that the patient abstain from spirituous drinks, and avoid strong mental emotions of every kind. Inordinate venereal gratifications, too, are in general decidedly injurious; and strong corporeal exertions, particularly walking up hill, or rapidly ascending stairs, as well as sudden atmospheric vicissitudes, indigestible and irritating articles of food, must be carefully avoided.

CHAPTER VI.

CHRONIC DISEASES OF THE ALIMENTARY CANAL.

Sect. I.—*Indigestion.*

Indigestion occurs so frequently, and is attended with so discomforting a train of symptoms, that it has the strongest claims upon the attention and sympathy of the physician. The habitual dyspeptic is indeed truly miserable. His sallow and anxious countenance, his irritable and sullen taciturnity, his aversion to social enjoyments, and the occasional overwhelming despondency of his mind, show him to be the prey of deep and harassing sufferings, of which none but those who have experienced them can form an adequate idea. Common, however, as indigestion is, and serious as are its consequences upon the health and happiness of man, there is perhaps hardly any other malady which is so commonly misunderstood, and consequently mismanaged.

In order to obtain a correct view of the pathology of indigestion, and of the true indications for its remedial management, it is necessary to be acquainted with the physiology of the process of digestion. I can here, however, advert only to the prominent and essential circumstances in relation to this subject. It appears, then, to be satisfactorily demonstrated, that the two following conditions are essential to the regular and healthy performance of the functions of digestion.

1. A due tone and peristaltic action of the muscular coat of the stomach, in order that the food may be uniformly embraced by the parietes of this organ, and as it successively undergoes chymification, where it is in contact with the stomach, be pushed forward towards the pylorus into the duodenum.

2. The regular secretion of a sufficient quantity of healthy gastric juice. That the fluid called gastric juice is really the solvent which converts the aliment into that pultaceous mass called chyme, and that, therefore, digestion, so far as chymification is concerned, is chiefly effected by the agency of this fluid, is, I think, established beyond all dispute. The experiments of Spallanzani, of Stevens, of Gosse, and those quite recently performed by Tiedemann and Gmelin of Heidelberg, and by Leuret and Lassaigne of Paris, have placed this physiological fact beyond all reasonable doubt.

It does not appear, from some late experiments, that the bile has any material agency in the process of chymification. According to the experiments performed in relation to this point by Mayo, Brodie, Leuret, Lassaigne, Tiedemann, and Gmelin, chymification appears to go on perfectly in animals after the biliary duct has been tied. The principal agency of the bile in digestion, it would seem, is to render the fatty substances of the chyme soluble in the chyle. It is the fat or oil thus suspended, by means of the alkaline properties of the bile, that gives to the chyle its milky color. When the common duct is tied, chymification goes on regularly, but the chyle in the lacteals and thoracic duct is transparent and of a yellowish hue.

Causes of indigestion.—It has just been said that the immediate cause of indigestion consists in a vitiated or deficient secretion of the gastric juice, and in deficient or irregular action of the muscular coat of the stomach. Now as both muscular motion and secretion are under the immediate influence of the nervous power, it is obvious that whatever causes morbid excitement in the nervous structure of this organ, must necessarily tend to derange the healthy performance of these two functions. Accordingly, everything which is capable of causing indigestion does so either by interrupting the regular supply of nervous influence to the stomach, or by irritating the nervous extremities of the mucous membrane of this organ; or by producing both these effects simultaneously.

Of these former kinds of causes, namely, those that interfere with the regular transmission of nervous influence to the stomach, are the *mental emotions*. It is surprising how suddenly any temporary mental agitation depresses, nay, often wholly suspends for a time the keenest appetite and powers of digestion. These temporary depressions of appetite and powers of digestion from sudden emotions of the mind, are converted into protracted and exceedingly unmanageable cases of dyspepsia, when the mental perturbations are of a chronic and depressing character. Protracted grief and despondency seldom fail to weaken the digestive powers and to bring on, ultimately, confirmed and unyielding indigestion.

Protracted and intense application of the mind, especially when attended with a sedentary mode of life, is another of those causes which act through the medium of the general system. Such, indeed, are the sympathetic relations of the stomach with the whole and every part of the organization, that its functions become disturbed by whatever causes either general debility or organic disorder of any of the principal organs of the body.

But by far the most common and powerful causes of indigestion are those that act directly upon the nervous extremities of the mucous membrane of the stomach. Whatever is calculated to cause permanent irritation in this membrane, has a direct tendency to produce this disease. I think it may be assumed as a pathological axiom, that the functions of secretion can never be deranged without the existence of *irritation* in the secreting organ. Irritation of the vascular extremities that secrete the gastric fluid, exists, therefore, in every case of indigestion. The causes which most frequently give rise to this irritation consist of overdistension of the stomach and indigestible and irritating articles of food. The manner in which food of this kind produces the irritation in question, is easily to be understood. When the food resists the digestive powers too long, besides its direct irritating impressions upon the stomach, it enters more or less into the fermentative process, and evolves new combinations, such as gas, acidity, &c., which enhance the irritating qualities of the contents of the stomach. Besides

these consequences of too long a retention of imperfectly digested food in the stomach, the muscular powers of this organ will be diminished by the long and continued exercise to which it is subjected, as well as by the over-distension and irritation caused by the gas. Portions, too, of the half-digested food will pass into the duodenum, which, being altogether uncongenial to the sensibility of this organ, will give rise in it to irritation, spasm and pain, and by sympathy, functional derangement of the liver. When this state of things is once produced by some error in diet, assisted, perhaps, by general causes, the slightest causes—even the ordinary digestible and plain diet taken in health—will not only sustain it, but often increase its violence, if favored by other circumstances of a debilitating character.

Dr. Philip thinks that *over-distension* of the stomach, by eating too much, is one of the most common causes of dyspepsia, and there can be no doubt as to its decided tendency in this way. It is probable, however, I think, that it is not so much by an over-distension of the muscular coat of the stomach which a superabundance of ingesta produces, that indigestion is caused, as by the mere excess of food beyond what the stomach is capable of digesting. Suppose the utmost powers of the stomach to be capable of digesting sixteen ounces of food at a time; it is manifest, that if twenty ounces are taken, some of it will remain either in a partially digested, or wholly undigested state in the stomach, a longer time than is compatible with the healthy condition of the organ. The portion will, therefore, irritate the gastric nerves—enter more or less into a state of chemical decomposition, and give rise to deficient or vitiated secretions in the stomach, as well as debility of its muscular tunic. The effects which follow the reception into the stomach of an undue proportion of food, besides those of mere over-distension, do not differ from those which are caused by indigestible articles of diet. A small portion of food which resists the digestive powers, is capable of bringing on violent dyspepsia, by remaining in the stomach beyond the period which is allotted by nature to the process of digestion, and becoming thereby a source of irritation in the manner already mentioned. Just so does it happen when the portion of food, however digestible, is greater than the stomach is capable of digesting at a time: for the portion which remains in an undigested state, and which the stomach is no longer able to convert into chyme, will act like so much indigestible food, and give rise to the distressing consequences which often result from such articles of diet.

The causes which most commonly occasion the reception of more aliment into the stomach than its powers are capable of converting into chyme, are:

1. *Eating too fast.*—Dr. Philip has satisfactorily explained the way in which rapid eating tends to cause persons to take more food than they are able easily to digest. "The appetite subsides only in proportion as the gastric juice becomes mixed, and, as it were, neutralized by the food. When we eat rapidly, time is not given to the gastric liquor to combine with that part of the food which is presented to it; the sensation of hunger therefore continues, and we continue to eat until so much food is taken that the whole gastric fluid which the stomach is capable of supplying during the digestive process, is not sufficient to effect the due chymification of it. Whereas, when we eat slowly, so that a proper time is given for the combination to take place, the appetite abates before the stomach is overcharged. Every one has occasionally observed, that if his meal is interrupted for ten or fifteen minutes after having eaten perhaps not one-third of the usual quantity, he finds that he is satisfied. The gastric fluid which had accumulated has had time to combine with, and be neutralized by the food he has taken. It is for the same reason that a few mouthfuls of food taken a little before dinner, will often wholly destroy the appetite, especially in delicate people in whom the gastric fluid is secreted in small quantity, or of a less active quality."

2. *Imperfect mastication* acts in the same manner, and as it is always connected with rapid eating, contributes greatly to this latter cause.

3. *The use of condiments*, stimulating drinks, and high-seasoned food. These

excite an artificial appetite, and keep up the desire for food longer than it would be sustained by the impressions simply of the gastric fluid.

The free use of very cold or warm drinks, particularly during meals, tends much to weaken the digestion, and to aid other causes in the production of dyspepsia. By drinking freely, the gastric fluid is so much diluted that its powers are weakened, and of course the process of digestion more or less retarded. *A very mixed diet*—especially if the articles are of unequal degrees of digestibility—is a frequent cause of indigestion.

I have stated above, that a tardy peristaltic action of the muscular coat of the stomach, by which the digested portions of food are too long retained in this organ, is very often concerned in the production of dyspeptic symptoms. I am persuaded, however, that the reverse condition also very frequently obtains, in cases of painful and imperfect digestion—namely, that the food is too rapidly hurried through the stomach into the duodenum, before it has had time to undergo the full action of the gastric fluid. This appears most commonly to be the case in confirmed instances of the disease—or in such as are attended with a high degree of irritation, or a sub-inflammatory condition of the mucous membrane of the primæ viæ.

That a morbid peristaltic activity of the stomach often exists in dyspepsia, may be inferred from the consequences which are known to result from high irritation or phlogosis of the mucous membrane of the intestinal tube. The phenomena of indigestion in aggravated cases also confirm the correctness of this opinion. It is a common circumstance, for instance, to hear dyspeptics complain of a sense of fullness in the stomach after eating even a small portion of food. But notwithstanding this feeling of repletion, they soon complain again of the customary sense of emptiness in the region of the stomach, and crave more food. It is to be observed, likewise, that the chief distress or uneasiness in such cases, is not experienced in the stomach, but rather in the region of the duodenum. Many dyspeptics feel no particular uneasiness until an hour or two after eating, when they begin to experience pain and distension in the duodenum. In some cases the food is speedily hurried off by the bowels in an imperfectly digested condition, under very severe suffering from tormina and flatulent distension of the intestines.

In some instances, severe and obstinate dyspeptic affections depend on a primary irritation of some portion of the spinal marrow, or of the roots of some of the spinal nerves. "Many cases of dyspepsia," says Mr. Teale, "which had resisted the usual mode of treatment, I have found to be connected with tenderness, on pressing some of the middle or lower dorsal vertebræ, and on removing the tenderness in the spine and neighboring parts, by proper remedies, the stomach affection and attendant symptoms have been almost immediately removed." In addition to the ordinary symptoms of indigestion, patients affected in this way usually complain of a peculiar sense of faintness or sinking at the epigastrium, and a tightness or constriction along the inferior margin of the chest. In some instances, also, the patient is frequently much harassed with flatulency of the stomach. This flatulency, says Mr. Teale, differs from that which arises from the decomposition of food so common in disorders of the stomach, by the rapid and copious formation of the air. The stomach is often, almost instantly, greatly distended with flatus, even where there is no obvious cause for its production. Sometimes the collection of air occurs more slowly, continuing for many hours or even days. Mr. Teale states that he has in some instances known firm pressure on the painful or tender part of the spine instantly to cause a sudden copious formation of flatus in the stomach.

Symptoms and course.—The symptoms of indigestion differ considerably according to the stage of the complaint, or the degree and extent of the irritation. In the commencement the appetite is variable, generally weak, and often entirely destroyed; the patient is troubled with flatulency, distension, acid eructations, and colic pains; the mind is, at times, depressed and languid; the tongue covered

with a white fur; the bowels usually constipated; the whole system languid, particularly during the process of digestion; and there is almost a constant uneasy feeling in the epigastrium. Sometimes the appetite is morbidly craving, but if the patient indulges freely in taking food, he becomes much oppressed, and generally suffers severe pains some hours after eating. After the disease has continued for some time, or has been aggravated by some unusual irritating cause applied to the stomach, the pulse becomes tense and quick; the epigastrium tender to the touch; the mind irritable, discontented and gloomy. The colic pains, some time after taking food, are more frequent and severe; the bowels become irregular—being sometimes constipated; at others affected with diarrhœa, during which, portions of food are occasionally passed off in an imperfectly digested state—the stools varying in color, consistence, and character. The body now begins to waste, and the strength fails; the epigastric distress becomes severe and constant; the countenance assumes a haggard and sallow aspect; the patient complains of more or less difficulty of lying on the left side; the skin becomes dry and shriveled, and there is usually a morbid sensibility to low temperature.

From the extensive sympathies which subsist between the stomach and every other part of the living body, dyspeptics are frequently much harassed by painful and other distressing affections in parts situated remotely from the stomach. Among these sympathetic affections of indigestion, *headache* is the most common and annoying. Dr. Warner observes, that there are two sorts of dyspeptic headache, the one occurring while the process of chymification is going on slowly and imperfectly in the stomach, and the other after the chyme has left the stomach and passed into the duodenum. The former is distinguished by a languid and feeble pulse, a slightly coated and whitish tongue, with very pale red edges, mistiness before the eyes, slight vertigo, and an apprehension of falling; slight nausea and uneasiness in the stomach; a sense of constriction about the fauces; and sometimes a coldness and numbness of the fingers; and generally a feeling of weight in the brain. The second, or as Dr. Paris calls it, *duodenal* dyspeptic headache, is characterized by *brilliant ocular spectra* which constantly distress the patient; by the chilliness of the body, and the coldness and dampness of the hands and feet. The pain in the head is very severe, and is attended with a sensation of coldness and tension of the scalp, and a sense of weight and distension in the eyeballs. The tongue is commonly covered with a yellowish-white fur, and is often much coated. The pulse is natural in frequency, but always languid. There is usually flatulency, and Dr. Paris states that a peculiar feeling of dryness and inactivity of the bowels, as if the intestines had lost their sensibility and were unable to propel their contents, giving rise to a peculiar sensation of weight and obstruction, may be regarded a pathognomonic of this variety of the affection. These headaches rarely continue longer than two or three hours, and are usually diffused throughout the whole head.

In a practical point of view, it is of great importance to bear in mind that dyspepsia may depend on two distinct morbid conditions of the digestive organs: namely, 1. On functional debility of the stomach from deficient or vitiated secretion of the gastric fluid, and muscular inactivity, independent of vascular irritation or inflammation. 2. On deficient or vitiated secretion of the gastric fluid, *with* vascular *irritation* or *chronic inflammation* of the mucous membrane of the stomach and duodenum, and a morbidly increased peristaltic action of these organs.

The characteristic symptoms of the former grade of indigestion are, weak appetite; tongue covered with white fur; *absence of epigastric tenderness*, except after a paroxysm of colic from flatulent distension; *costiveness;* acid and fetid eructations; absence of *habitual tension and febrile irritation of the pulse;* and the ability of bearing lean and tender animal food better than vegetable and farinaceous articles of diet.

The phenomena which characterize the second or inflammatory grade of the disease, are tenderness to pressure of the epigastrium, and particularly about the

region of the pylorus and duodenum; a red, chapped, granulated or glossy appearance of the tongue; a firm, tense, small, and somewhat accelerated pulse, with slight manifestations of febrile exacerbations towards evening; emaciation; irregular action of the bowels, with frequent attacks of mucous, bilious or watery diarrhœa; violent and protracted pain in the lower part of the epigastrium during the process of digestion: fullness about the edge of the false ribs on the right side; and anxious and discontented expression of the countenance: and inability, without great suffering, to endure animal food and stimulants. It appears that the irritation or chronic inflammation of such cases is seated in the mucous membrane of the *pyloric extremity* of the stomach and of the *duodenum*, connected usually with a congested state of the liver, and often with fecal accumulations in the colon. Hence the region of the duodenum and pylorus is almost invariably somewhat distended, and very tender to pressure in such cases; and these circumstances, together with the tense and quick pulse, furnish the most certain diagnosis of the existence of high mucous irritation or chronic inflammation in dyspeptic complaints.

In some instances, the pain and tenderness extend across the epigastrium into the left side, and become fixed in the region of the spleen, or where the colon turns down to form the descending arch. The pain and tenderness in the left side appear to depend on various causes, "all of which," says Dr. Philip, "are more unfavorable than the circumstances which cause its existence in the region of the pylorus and duodenum."* It may depend on an inflamed and engorged condition of the spleen, in which case this viscus is generally found in an enlarged condition. It arises, also, sometimes, from enlargement of the left lobe of the liver, "which is always the part of this organ most affected in indigestion." According to the observations of Dr. Philip, however, the most common cause of the pain and tenderness in the left side is the extension of the chronic inflammation from the pylorus to the other parts of the stomach.

There is generally much difficulty in distinguishing pain and tenderness seated in that part of the colon which lies over the pylorus, from the same affections in this portion of the stomach and duodenum. "The best means for distinguishing affections of the stomach from those of the colon are, the digestive process in the latter case being better performed; the state of the bile being less disordered; the patient not experiencing the increase of uneasiness which often comes on after meals, for a considerable time after eating, and often experiencing more or less pain, or some other uneasiness in the region of the stomach a short time before the bowels are moved, and more or less relief soon after their action." (Philip.) Pain and tenderness on pressure cannot, however, be regarded as an unequivocal sign of inflammation in the pylorus and duodenum. This part sometimes becomes morbidly sensitive, without capillary congestion or inflammation. Nevertheless, where we find this tenderness a little below and to the right of the pit of the stomach, at the same time that the sides and tip of the tongue are red, with a granulated surface and a dry streak in the middle, together with a tense and quick pulse, we may be assured that the parts just mentioned are in a state of inflammation.

Treatment.—One of the first things to be attended to when we are called to prescribe in a case of dyspepsia, is to obviate, as far as possible, the usual exciting causes of this distressing affection; and with this view, we must direct our attention chiefly to the adoption of proper *dietetic regulations*. In all cases of dyspepsia, whether simple or complicated, mild or violent, an undeviating observance of suitable regulations in relation both to the quantity and quality of the aliment, and the manner of taking it, is absolutely indispensable to success in the management of the disease. The patient should be directed to masticate well and slowly; to take his meals at regular hours; to eat no more at a time than is just sufficient to sustain the powers of the system; to drink but little during and for a short

* On the Treatment of the more Protracted Cases of Indigestion. London, 1827, p. 19.

time after taking food; and he must avoid taking any active exercise during the first stage of the process of digestion. The presence or absence of symptoms indicative of high irritation or sub-inflammation in the mucous membrane of the stomach and duodenum will enable us to say, almost with certainty, whether an *animal* or vegetable diet will procure most relief to the patient; but in relation to the particular articles of these two kinds of aliment, no specific directions can be given which are applicable to all cases: for some dyspeptics are benefited by certain articles of food that are altogether intolerable to others. This is more especially apt to be the case in those habitual dyspeptic cases which depend on mere functional debility, with morbid sensibility of the stomach, unconnected with inflammation. In some cases the dyspeptic symptoms are excited only by particular aliments; "and we must endeavor to ascertain whether a peculiar idiosyncrasy of the stomach prevails in such instances, or whether there is a debilitated condition of the organ that incapacitates it from digesting any food demanding considerable powers for its chymification." Every individual affected, and suffering under this grade of dyspepsia, must in a great measure learn from his own experience, what articles of diet will or will not agree with him. In general, however, where the disease depends more on debility of the digestive organs, without a fixed tenderness and fullness in the epigastrium, the more digestible kinds of *animal* food are decidedly the most proper. In such cases, a plain abstemious diet of this kind, together with the occasional use of gentle aperients, mild tonics, regular exercise, and a rigid avoidance of the usual exciting causes of the complaint, will rarely fail to establish a cure, or at least to procure an exemption from its more disturbing symptoms. *Animal* is undoubtedly much more digestible than *vegetable* food; and where the gastric irritation is not considerable, it will very generally be taken with the least inconvenience by dyspeptic persons. We may lay it down, therefore, as a general principle, that animal food is the most proper; and of this the most tender muscular parts are to be selected. There is nothing to be apprehended from the stimulant qualities of animal food, in cases depending on debility, without any particular morbid irritability or phlogosis of the digestive organs. Our object here is to obtain the most digestible food, and which is, at the same time, the least apt to enter into fermentative decomposition. By a food of this kind, the debilitated stomach is moderately excited, and subject to less labor; while the chyme is more speedily and perfectly formed, and the development of acid flatus, &c. thus, in a great degree, prevented. It is very different, however, with those cases of protracted and inveterate dyspepsia that are attended with a red tongue, tender and somewhat tumid epigastrium, and a firm pulse. Here the food, as I shall presently state more particularly, must be as bland and as unirritating as possible.

Much attention has been directed to inquiries concerning the comparative digestibility of the various customary articles of food. All agree that the flesh of old animals, with the exception of beef and veal, is more digestible than that of young animals. The latter contains much more mucilaginous matter than the former; and all mucilages are of difficult digestion. Animal jellies, and young meats, observes Dr. Philip, are what is commonly called *light* food, with a reference to their stimulating qualities, or tendency to excite fever—and hence, in persons recovering from fever, or in extremely irritable habits, we prescribe the animal jellies, or *young* meats which contain them in abundance, in preference to the meats of old animals. In dyspepsia, however, from mere gastric debility, animal jellies remain long in the stomach, from their indigestible nature, and cause, therefore, more disturbance and distress than beef or mutton. Tender beef, mutton, and all kinds of game, more especially vension, are usually of easy digestion, and generally agree much better with dyspeptics, during the early stages of the disease, than any other article of diet. Pork and veal are, with most persons affected with indigestion, altogether inadmissible; and fish, too, seldom agrees well except when taken in very small portions, and in a boiled state. The most oppressive kinds of poultry are geese and ducks; and "turkey is more

oppressive than *fowl*, which, next to mutton, is, perhaps, upon the whole, the lightest animal food in common use, if *the skin be avoided.*" Pheasant is the least easy of digestion of the different kinds of wild game; but *partridge* and *hare* are in general readily digested by weak stomachs. Soft-boiled eggs will sometimes agree very well with dyspeptics; but care must be taken not to eat the coagulated portions of the albumen. Simple *roasting* or *boiling* is the best way of preparing meats for persons laboring under indigestion—*fried* articles of food being in general very oppressive. There is no aliment more offensive to a weak stomach than *new made bread.* By mastication it is converted into a tenacious paste, which "is not easily pervaded by the gastric juice," and is, therefore, always very slowly converted into chyme. The bread used by a dyspeptic person should always be several days old; and, for a change, crackers, or "pilot-bread," may be used. Some individuals derive much advantage from the employment of *bran-bread*, but I have reason to think that, where there exists a morbid sensibility of the stomach, it is generally decidedly injurious. The only benefit that can be obtained from bran-bread beyond what may be derived from common bread, arises from its gently stimulating the bowels, and keeping up regular alvine evacuations; but I have known it to produce disagreeable irritation both in the stomach and bowels, by the small cuticular scales of the grain which it contains, and which are almost insoluble in the gastric fluid. Cheese, milk, cream, and butter, unless taken in very moderate portions, are apt to become oppressive. I have known dyspeptic individuals, however, who were much benefited by the habitual use of cream and crackers at their meals. Fresh vegetables are very generally injurious, particularly cabbage, peas, beans; and, above all, cucumbers, lettuce, celery, and other articles of this kind taken in the form of a salad, or in an uncooked state.* Of fruits, pears, currants, gooseberries, whortleberries, and melons, are generally most apt to prove injurious. Mealy potatoes and turnips are among the best articles of this kind for dyspeptic subjects. All kinds of pastry, such as hot cakes, pies, puddings, &c., are entirely out of the question. The food of a person laboring under dyspepsia from gastric debility, should be chiefly taken in a solid state. Soups and broths very rarely do well in cases of this kind. I have already stated, that slow eating and perfect mastication are all-important observances in dyspepsia, and that but very little drink should be taken during, or soon after meals. Moderate portions of brandy and water usually answer well in slight cases of indigestion, but in the more aggravated forms of the disease they are exceedingly improper. Simplicity in diet, too, is of great importance to the comfort of dyspeptics; and what is of equal, if not still greater importance, is, to take but moderate portions of food into the stomach at each meal.

It must not be forgotten that the foregoing dietetic observations apply only to those cases of indigestion which are free from a morbidly sensitive and irritable or an inflamed condition of the digestive organs. The signs by which these conditions may be detected have already been mentioned; and it is of the utmost importance to form a correct diagnosis on this subject. So far from solid animal food being the best aliment in cases of this kind, nothing but the lightest farinaceous articles of diet can be borne with any degree of comfort, or are compatible with the restoration of the healthy state of the stomach.

These cases must indeed be treated in every respect as instances of *chronic* gastro-enteritis, and the observations that I have made with regard to the diet in these affections, are therefore fully applicable to *inveterate* cases of dyspepsia.

Medicinal treatment.—When the disease depends on functional derangement from mere debility or inactivity of the digestive organs, the bowels are generally

* [The capriciousness of some dyspeptic stomachs is remarkable enough. I have known several cases in which raw turnips and radishes, and even cucumbers, could be eaten with impunity when the best selected articles of diet would always disagree. Dr. Chapman, in his excellent chapter on indigestion, relates a curious case of this kind, in which an exclusive diet of green corn effected a cure after everything else had been rejected.—Mc.]

torpid, and loaded with feculent matter, and hence an important indication in cases of this kind is to procure regular alvine evacuations by diet, if possible; if not, by the occasional use of gentle aperients. When first consulted in dyspepsia of this grade of gastric disorder, it will, in general, be necessary to prescribe a laxative sufficiently active to evacuate the bowels freely; but when the infarcted state of the alimentary canal has once been removed, the gentlest articles of this kind, and in doses barely sufficient to procure one or two consistent evacuations, should alone be employed. If, indeed, the action of the bowels can be regularly maintained by dietetic regulations, it ought always to be preferred to the exhibition of laxatives. This, however, can rarely be adequately done, and almost all dyspeptics find it necessary to resort, more or less frequently, to remedial means for procuring regular alvine evacuations. Rhubarb, in union with some aromatic or stimulating substance, will in general answer well as an aperient in such cases. The following pill* may be taken a short time before the principal meal; and where there is much acidity in the stomach, the rhubarb may be advantageously given in combination with from ten to twenty grains of the carbonate of soda, or with thirty or forty grains of magnesia. No remedy, however, has appeared to me to act more favorably as an aperient in the milder grades of habitual dyspepsia than small doses of ipecacuanha in union with aloes and the extract of hyoscyamus. From personal experience, I know that in some instances, at least, the effects of this combination are peculiarly soothing and sufficiently aperient.†

Emetics were formerly much employed in dyspepsia; but except in recent attacks from a surfeit or very irritating and indigestible ingesta, their use is now very properly almost universally condemned. Where it may be deemed advisable to excite vomiting we may generally effect this purpose by copious draughts of lukewarm water, or what is still better, strong infusions of chamomile flowers, or of the eupatorium perfoliatum. When these do not procure adequate emesis, an ordinary dose of ipecacuanha may be administered. *Tartar emetic* is decidedly objectionable, even under the strongest indications for the employment of an emetic in dyspepsia. Where the disease is connected with morbid sensibility of the stomach, or with chronic inflammation, no circumstance, perhaps, can justify the exhibition of an emetic.

In the grade of indigestion now particularly under consideration, besides the dietetic measures already indicated, and an attention to the regular maintenance of the alvine evacuations, *mild tonics* in combination with *alkalies*, gentle exercise, and the avoidance of the usual exciting causes of the disease, will generally restore the healthy functions of the digestive organs. A weak infusion of *columba* or of *gentian*, with a portion of the carbonate of soda, or of potash, may be employed for this purpose. The ferruginous preparations also are often peculiarly beneficial in cases of debilitated digestive powers, without any prominent hepatic derangement. The tartrate of iron, given in union with a small portion of ipecacuanha, has done much good in my hands in no inconsiderable number of cases.‡ The chalybeate mineral waters, also, will occasionally procure more benefit in instances of this kind than any other tonic. The white mustard seed has of late years been a very fashionable remedy for dyspepsia, and in cases of simple languor and weakness of the stomach, very considerable

* ℞.—Pulv. rhæi gr. ii.
—— aloes gr. ss.
—— capsici gr. i.—M. To be made into a pill.

† ℞.—G. aloes Socot. ℈i.
P. ipecac. ℥ss.
Extract. hyoscyamus ℈i.—M. Divide into twenty pills. Take one at night on going to bed.

‡ ℞.—Tart. ferri ℥i.
Pulv. ipecac. gr. v.—M. Divide into three equal parts. Take one every morning, noon and evening.

advantage may in general be derived from them. Four or five teaspoonfuls of the unbruised seed should be taken during the course of the day. I have known several individuals habitually subjected to slow and painful digestion with torpor of the bowels, much benefited by this remedy. It need scarcely be observed that where the stomach is morbidly irritable and tender to pressure, this article cannot be taken without injurious consequences. Tonics are frequently much abused in this affection, and may readily do much mischief where there is great irritability of the stomach or a state of phlogosis, and especially where the hepatic functions are prominently deranged. They can be employed with a prospect of advantage only in cases of torpor or weakness of the digestive organs. Indigestion seldom continues long, even in its milder grades, without involving the liver in functional disorder; and hence, alterative doses of *mercury* have of late years been among the most common means in dyspeptic affections. Where, from the icterode state of the eyes and skin, and the appearances of the stools and urine, there is reason to suspect the existence of functional disorder of the liver, the use of alterative portions of the blue mass is decidedly indicated, and will generally afford benefit. From four to six grains of the blue pill may be taken every second or third night, with an occasional dose of some gentle laxative—such as small portions of rhubarb, or one or two Seidlitz powders, or a few of the laxative pills already mentioned. I have been much in the habit of giving the blue mass in union with a laxative, according to the following formula; and generally, as it appeared to me, with more advantage than when they are given separately and at distinct periods.* Care must be taken, however, in prescribing mercury in this affection, not to continue its use until the general system becomes affected; for general mercurial excitement is always improper in dyspepsia. Some individuals are always very disagreeably affected by the blue pill. I have met with dyspeptic patients in whom this mercurial invariably excited the most unpleasant sensations in the stomach, as well as great general restlessness and nervous irritation. When this is the case, we may generally gain our object by the internal use of nitric acid diluted in a large portion of water; or what has appeared to me still more advantageous, the nitro-muriatic acid bath, in the way mentioned under the head of chronic hepatitis.†

As palliatives, *alkalies* and *opium* are the best remedies we possess—the former for removing the burning and aching sensations which are caused by acidity in the stomach, and the latter for allaying the cholic pains that result from the irritation of the food, flatus and acid in the stomach and duodenum. It is to be observed, however, that opium cannot be frequently employed in this affection without still further impairing the digestive powers of the stomach; but the pains are so often extremely violent, that we are obliged to resort to this narcotic for relief. In those cases of dyspepsia which are connected with a high degree of morbid sensibility of the mucous membrane of the stomach and duodenum, the occasional use of this anodyne is peculiarly valuable. Without it, indeed, patients laboring under this variety of dyspepsia would enjoy but few moments of exemption from suffering. Dr. Philip recommends Dover's powder, and advises that from two to four grains of it should be given every six or eight hours. This will commonly be sufficient to allay the general nervous irritation which is apt to occur in cases of this kind; but when those violent gastric and duodenal pains come on, which at times rack the unfortunate dyspeptic, nothing but the largest doses of laudanum will be

* ℞.—Massæ hydrar. ʒi.
G. aloes Socot. ℈ss.
Tart. antimonii gr. ii.—M. Divide into twenty pills. Take one every other night on going to bed.

† [The domestic remedy for dyspeptics which was so generally prescribed by the late Dr. Physick, has become quite popular in this country. It consists of a *lixivium* of one quart of hickory ashes and a teaspoonful of soot in a gallon of water. A wineglassful of this ley given three times a-day, is supposed to afford all the advantages derivable from a combination of potassa and creasote.—Mc.]

sufficient to allay his extreme suffering. I have known persons in the utmost degree of agony for hours, from irritation in the stomach and duodenum, who were obliged to take several hundred drops of laudanum before relief was procured; and in this respect, I may, indeed, truly say with the poet—

Atque utinam numero ne nos essemus in isto.

Weak and slow digestion is frequently connected with a morbid sensibility of the nerves of the stomach and duodenum, independent of chronic inflammation of these organs. When the patient is subject to severe pains an hour or two after taking a meal—and more especially when the gastric distress is particularly excited by *certain* articles of food which usually agree with other dyspeptics, and when, moreover, the edges of the tongue remain of a pale red, with a thin white fur over the middle, and the pulse is free from tension, though quick and small, and the skin generally soft, and below the natural temperature; and, finally, when with these symptoms there is a disagreeable or painful feeling of emptiness experienced in the region of the stomach four or five hours after taking food, without any particular tenderness to pressure on the epigastrium—when these symptoms exist, there is reason for believing that an exalted sensibility of the gastric nerves is present without phlogosis. The diagnosis in relation to these circumstances, is of much more importance, in a practical point of view, than seems to be generally supposed. Dr. Philip speaks particularly in favor of the employment of *ammonia*, in what he calls the second stage of indigestion, and it is, indeed, in many cases, deserving of all the encomiums which he has bestowed upon it. The instances, however, in which, according to my own observations, it is most apt to prove beneficial, are those in which there is a constant tendency to the generation of acid in the primæ viæ, in connection with morbid sensibility of the mucous membrane of the stomach and duodenum. In cases of this kind, eight or ten grains of the carbonate of ammonia with five or six grains of Dover's powder may be taken several times during the day with much temporary benefit. Dr. Philip observes, that in cases of dyspepsia, where the surface is cold, the pulse feeble, with a feeling of general depression and chilliness, "the ammonia is invaluable; being less apt than any other stimulus of the same power, with respect to the nerves, to excite the heart and blood-vessels; which, from the tendency of the disease, (in this the second stage,) are inclined to a degree of excitement beyond that undue proportion to the state of the other powers." Much relief may also be obtained, in cases where the disorder is attended with much irritation and sensibility of the gastric nerves, from the *liq. acetat. ammoniæ*, in union with small doses of laudanum, or of the tincture of hyoscyamus. A tablespoonful of the former, with ten drops of either of these narcotic tinctures, may be taken two or three times daily.

When there is much gastric irritation, with slight febrile symptoms towards evening, such as dryness and heat of the skin, burning in the palms of the hands and the soles of the feet, and tension of the pulse, the *nitrate of potash* will generally afford considerable relief. It may be advantageously given with minute portions of the tincture of ipecacuanha, dissolved in some mucilaginous fluid. From five to ten grains of the nitre, dissolved in a few ounces of barley-water, or of a solution of gum Arabic, with fifty drops of tinct. ipecac., may be given every four hours.

When the gastric irritation has assumed the character of chronic inflammation—that is, when in addition to the general symptoms just mentioned, the epigastrium becomes tender to pressure, the pulse tense and firm, and the edges and tip of the tongue red, tonics, purgatives, animal food, and all stimulating remedies, are no longer admissible. Leeching or blistering over the region of the pylorus and duodenum is here one of the most important remedial measures. The latter, indeed, will often be found particularly beneficial in cases attended only with high irritation, without actual inflammation. For the removal of that morbidly sensitive condition of the gastric nerves noticed above, there is, perhaps, no remedy

so effectual as the application of a blister over the epigastrium. I have known patients who could scarcely take even the blandest articles of food without suffering a great deal of pain, enabled to digest light aliment with tolerable comfort after having the region of the stomach blistered. Pustulation with the tartar emetic ointment, may also be resorted to with a fair prospect of advantage in such cases. Leeching, however, is always an excellent preliminary to vesicating or counter-irritating applications. There is but little advantage to be obtained from internal remedies in cases of this kind; yet the nitrate of potash, dissolved in a large portion of some mucilaginous fluid, will occasionally assist in removing the dry and constricted state of the skin, and the distressing sense of internal heat. Dr. Philip advises the exhibition of small doses of *tartarized antimony*. I have occasionally, derived some benefit from its administration in cases attended only with gastric irritation; but I doubt much of the propriety of employing this remedy where unequivocal signs of mucous inflammation of the stomach are present.* Some writers recommend laxatives in this as in the milder varieties of the disease; but their tendency to irritate the tender and phlogosed mucous membrane of the stomach and intestines, renders them, I think, decidedly objectionable. Slight relief will, it is true, usually follow the operation of a purgative, but this relief is always but temporary, and is very often succeeded by an aggravation of the gastric distress and tenderness. The same objections do not, however, exist against the use of laxative enemata, and I do not, indeed, know any measure which is better calculated to afford ease, in cases of this kind, than the daily use of one or two mild laxative clysters. Functional disorder of the liver is a constant attendant in cases of this kind; and it becomes necessary to employ mercurials either internally or by frictions on the right hypochondrium. The employment of mercurials, however, requires great caution in the severer cases of the disease; for it is not uncommon to find the blue pill, even in small doses, to excite considerable intestinal irritation and general uneasiness. To avoid this occurrence, we may give this mercurial in union with a small portion of opium, or of the extract of conium. In general, it will be sufficient to administer one grain of the blue mass, with half a grain of opium, every night on going to bed, and care must be taken not to carry it to the extent of causing even a soreness of the gums. The correction of the biliary secretion, by a gradual introduction of mercury into the system, is generally attended with the additional advantage of an abatement in the tension and contraction of the pulse, and a diminution of the temperature and dryness of the skin.

After all, however, our principal reliance in cases attended with a high grade of irritation or chronic inflammation, consists in the use of a bland and unirritating liquid diet, local depletion, revulsive applications, and the occasional use of alterative doses of blue pill or calomel, with laxative enemata and gentle exercise by gestation or where the strength of the system will admit of it, *walking* regularly every day, until a slight degree of fatigue is induced.

Let it be constantly borne in mind, that functional derangement of the stomach may be the consequence of mere debility and relaxation—or of high irritation and morbid sensibility—or finally of a chronically inflamed condition of the mucous membrane of the digestive organs; and that, therefore, the mode of treatment, both medicinal and dietetic, which is proper in the first, will not answer in the second, and will prove decidedly pernicious in the third of these varieties. In the first, our object is to increase the tone and activity of the stomach; in the second, to soothe the irritation and morbid activity of this organ; and in the third, to subdue inflammation, and obviate its consequence—structural disorder.

It should also be recollected that disorder of the stomach, attended with

* [No internal remedy can be brought into competition in this condition of things with small doses of the nitrate of silver, made into a pill with simple bread or gum Arabic. I have frequently given it in combination with extract of hyoscyamus, ¼ to ½ gr. of the former to 1 gr. of the latter in each pill, repeated three times a day.—Mc]

harassing symptoms of indigestion, may be the direct consequence of spinal irritation. (Teale.) In all obstinate cases of indigestion, therefore, the spinal column ought to be carefully examined, in order to ascertain whether any portion of it be tender or painful to pressure. It cannot be doubted that spinal irritation sometimes produces great disorder of the digestive organs; and in such cases, it would be in vain to expect any relief, so long as the spinal affection continues. In cases of this kind, the tenderness to pressure is generally confined to the lower dorsal vertebræ. Should such tenderness or soreness be found to exist, cupping over the affected part of the spine, repeated, at intervals of four or five days, according to the obstinacy of the spinal irritation, will seldom fail to remove all the dyspeptic symptoms. Blisters, or rubefacient frictions, also, over the affected portion of the spine, will sometimes afford complete relief in instances of this kind.

Sect. II.—*Diarrhœa.*

Diarrhœa is an affection of the bowels, the characteristic symptoms of which are: frequent and usually copious liquid stools of a feculent character—attended with more or less griping without tenesmus, and generally without febrile irritation.

The proximate cause of diarrhœa consists, according to the sentiments of Cullen and some other writers, in increased peristaltic motion of the intestinal tube. Unquestionably, an inordinate peristaltic action does take place in this affection; but this increased action does not constitute the essential pathological condition of the disease, and cannot therefore be properly regarded as its proximate cause. Increased action of the intestinal canal may arise in two ways, namely: 1. The irritability of the bowels may be in a natural state, whilst the substances which are brought to act on them are of a peculiarly irritating or exciting character. In this case the alvine discharges will generally cease soon after the irritating substances which have excited them are expelled, or their activity is destroyed—as is the case with the purging produced by cathartics, or the action of other transient irritants. 2. The irritability of the bowels may be preternaturally increased; in which case, the ordinary secretions and contents of the intestinal canal, and even the mildest substances, will produce excessive peristaltic action, and of course frequent alvine discharges.

Irritation of the mucous membrane of the bowels, therefore, constitutes the primary morbid condition in diarrhœa, of which the increased peristaltic motion and the inordinate alvine evacuations are the consequences. When the diarrhœa continues long, or assumes a chronic form, the mucous irritation becomes fixed, and unless it be counteracted by an appropriate treatment, gradually passes into a state of chronic inflammation—more especially of the mucous membrane of the colon, and finally terminates in ulceration, and other forms of disorganization of this membrane. Broussais observes that when diarrhœa continues beyond the thirtieth day, it is almost invariably connected with organic derangement of the mucous membrane of the colon. When the disease continues until the irritation passes successively into chronic inflammation and disorganization of the mucous tissue of the bowels, slight febrile irritation occurs—particularly towards evening, and a few hours after eating; the pulse becomes quick, small, and frequent; the skin dry and harsh; the body emaciates more or less rapidly; and at last œdema of the feet and legs, and occasionally dropsical effusions into the cavity of the abdomen, ensue. In this aggravated form, the patient is apt to experience extremely severe colic pains an hour or so after taking food, and in general even the mildest ingesta are followed by tormina, flatulency, and diarrhœal discharges, and articles of food are sometimes passed in the stools in an imperfectly digested state. The appetite is generally very variable and capricious; being sometimes voracious, and at others entirely depressed. The stools, too, vary

much both in relation to frequency and appearance. They are sometimes slimy, mixed with more or less fecal matter; at others abundant and watery—occasionally dark, reddish, or whitish, and often contain small portions of undigested food. On post-mortem examination of subjects who have died from chronic diarrhœa, or from some other disease accompanied with this bowel affection, we sometimes discover irregular patches of a fungoid appearance, and of a livid or dark red color, slightly elevated above the surrounding parts, on the mucous membrane of some portion of the intestinal canal. In other instances, small, well-defined ulcers with elevated edges, or extensive irregular ulcerations with ragged edges, are met with. Not unfrequently the coats of the intestines are thickened at the parts where these ulcers are situated; and in some instances this thickening is so great as to diminish the area of the intestinal tube very considerably. In cases of this kind, says Broussais, the usual diarrhœal symptoms are apt to alternate with attacks of costiveness, and death occasionally occurs under symptoms resembling those of ileus. Sometimes, instead of ulcers, the mucous membrane is covered with numerous tuberculous elevations of different sizes; and occasionally extensive portions of this membrane are found covered with smooth cicatrices of ulcerations which have healed. Broussais observes that these ulcerations are always found most numerous in the cœcum, and about the lower portion of the colon. He thinks, and with great probability indeed, that when the feculent matters become fetid and putrid, whether from long retention or imperfect digestion, they cause irritation, and ultimately inflammation, in that part of the mucous membrane where they are most apt to become accumulated. When death occurs at an earlier period of diarrhœa, the mucous membrane of the colon, and of the ileum, is usually found in a more or less reddened or injected state, with slight thickening of its structure. This is particularly observed in those chronic diseases which, during the latter period of their course, are accompanied with colliquative diarrhœa. In the chronic diarrhœa of children, attending what is usually called marasmus, I have found in several instances on dissection, the mucous membrane of the lower portion of the small intestines and of the colon, exhibiting extensive tracks of a congeries of minutely injected vessels.

Causes.—The remote or occasional causes of diarrhœa are exceedingly various. They may be divided into those which act directly on the mucous membrane of the intestinal canal, and those which act indirectly through the medium of the general system. Of the former kind are all irritating substances received into or generated in the alimentary canal; and of these the most common are: irritating and indigestible articles of food and drink; acrid and vitiated secretions from the liver and intestinal exhalents; worms; acid generated in the bowels; fresh fruit, particularly such as are very sweet, or acid, &c. Limestone water is particularly apt to give rise to copious diarrhœa in those who have not been accustomed to its use; and new made cider, before it has undergone the fermentative process, is also extremely apt to excite this affection. Much, however, depends on the previous or habitual state of the irritability of the intestinal canal, with regard to the power of different articles to excite this affection. Some individuals, apparently in a state of good health, cannot take particular articles of diet or drink without suffering more or less from griping and diarrhœa, whilst in others no unpleasant effect whatever will result from the same articles. Idiosyncrasy, also, appears occasionally to be concerned in the production of this affection by causes of this kind. Thus, in some persons, fresh milk almost invariably excites diarrhœal discharges; and I know an individual who generally becomes affected with diarrhœa when he eats fresh oysters. Diarrhœa produced by causes of this kind is, however, almost always of temporary duration, and depends on simple irritation, which generally readily subsides after the offending matter has been discharged, and other exciting causes do not supervene. Nevertheless, if the bowels have previously been in an irritable condition, or if the patient be laboring under some organic visceral affection, instances which commence from such local irritating causes are apt to continue, and, unless particular

attention be paid to a careful avoidance of the further influence of the exciting causes of this affection, to give rise to high irritation, inflammation, and finally ulceration in some portion of the intestinal canal.

Among the causes of diarrhœa that affect the alimentary canal through the medium of the general system, *cold*, particularly when applied in a humid way to the feet or abdomen, is one of the most common and powerful. When produced by this cause it constitutes the *diarrhœa rheumatica* or *catarrhalis* of the German writers. Cases of this kind are most apt to occur during damp and variable weather, and the evacuations are generally very liquid or watery. Slight rheumatic or catarrhal symptoms are apt to accompany the disease—such as toothache, transient pains in the extremities, short cough and coryza, together with slight febrile irritation towards evening, attended with a dry mouth and great thirst. The tormina are usually exceedingly severe. The occurrence of diarrhœa from cold, or the conjoined agency of humidity and cold, depends, no doubt, on the centripetal direction given to the circulation; in consequence of which the liver and capillaries of the mucous membrane of the bowels become engorged with blood, giving rise to a vitiated, or perhaps a superabundant secretion of bile and intestinal mucus, at the same time that the irritability of the bowels is morbidly increased.

Diarrhœa appears also sometimes to arise from an epidemic condition of the atmosphere, independent of its thermometrical or hydrometrical states. This variety of the disease usually occurs in the autumn when the nights begin to be cool, and after a very dry and hot summer, and generally during the prevalence of other forms of intestinal diseases—particularly dysentery and cholera. Cases that proceed from causes of this kind are commonly preceded by the same train of premonitory symptoms that usher in miasmatic fevers—such as a feeling of weight and anxiety in the præcordia, loss of appetite, bitter taste, tension and fullness of the abdomen, disturbed sleep, headache, some lassitude and aching pain in the back, and slight sensations of creeping chilliness. (Richter.) Diarrhœa arising from this cause frequently passes into the dysenteric form of the disease. It is probable that these cases depend on the conjoined influence of koino-miasmata and atmospheric vicissitudes—giving rise to increased irritability, functional disorder, and sanguineous engorgement of the liver and intestinal canal, in a way which will be more particularly referred to under the head of Cholera. Besides these there are many other general causes capable of producing violent and protracted diarrhœa. The repercussion of acute and chronic cutaneous eruptions sometimes gives rise to obstinate attacks of this disease. It may also be produced by violent affections of the mind, particularly sudden terror and grief. Diarrhœa occurs very frequently in visceral and other local affections attended with suppuration and ulcerative disorganization. Thus, in the latter period of pulmonary consumption, colliquative diarrhœa almost invariably occurs; and the same may, indeed, be said of every variety of disease attended with hectic fever, or extensive suppurations.

In febrile diseases, diarrhœa sometimes occurs as a critical evacuation.* It can never be regarded as salutary, however, where it depends on the supervention of phlogosis, or high vascular irritation of the mucous membrane of the bowels. When the discharge is watery, reddish or muddy, mixed with flocculi of mucus, and the abdomen is tender and the tongue dry and red along the edges, it always indicates an aggravated condition of the disease, and the existence of mucous inflammation, and is of course a highly unfavorable occurrence. Critical diarrhœa appears generally to depend on a copious secretion of bile, or an increased discharge from the intestinal exhalents, co-operating, probably, with a morbid irritability of the bowels; and hence salutary discharges of this kind are almost invariably bilious, mixed with more or less feculent matter and intestinal

* Fr. Hoffman. Dissert. de Diarrhœa in Febribus Malignis Morbis Acutus Salutari. Buchner, Dissert. de Diarrhœa in Febribus Exanthematicis Salute et Noxa.

mucus. Watery discharges, free from bile, are rarely, if ever, indicative of a favorable tendency of the disease. During dentition, children are very liable to diarrhœa; but as this discharge, when moderate and unaccompanied with much gastro-enteric irritation, is calculated to lessen the tendency to preternatural determinations to the brain, it should not be checked in instances of this kind, unless it becomes excessive and very exhausting.

Prognosis.—When the diarrhœal discharge has been brought on by indigestible or irritating articles of food or drink, and consists principally of feculent matter and vitiated secretions, it may in general be readily checked, and unless greatly mismanaged, will rarely assume a dangerous character. In general diarrhœa is most apt to assume a chronic and dangerous character when it arises from the influence of cold and damp air, or from the habitual use of unwholesome and indigestible diet, in individuals laboring under some chronic visceral affection, or whose general health has been much impaired by previous diseases, hardships, or a course of intemperate living. When we find the disease to continue long, with frequent, watery, and acrid discharges, attended with tenderness in the abdomen on firm pressure, and extremely severe tormina, we may presume that there exists chronic inflammation, or at least high irritation in the mucous membrane of some portion of the bowels—and consequently that there is much danger of the occurrence of structural disorder in this tissue, if the disease be not soon removed by appropriate measures. Those cases of diarrhœa that assume a strictly chronic character, and in which scanty and painful diarrhœal evacuations of an unnatural appearance occasionally alternate with short periods of constipation, and severe pains are experienced in the track of the colon an hour or two after eating, may be regarded as certainly dependent on mucous inflammation, and most probably attended with more or less ulceration, and consequently with great danger and difficulty in effecting a cure.

Diarrhœa from the irritation of dentition, as has just been remarked, is rather a salutary than a dangerous affection; but when this *symptom* of enteric disease is accompanied with a pale and fretful expression of the countenance, a hard and tumid abdomen, frequent picking at the nose, voracious appetite, and the discharge of undigested portions of food in the stools, it must be considered as an affection of very serious import.

Treatment.—In the treatment of diarrhœa it should always be recollected that the characteristic alvine discharges, by which this affection is recognized, and from which its name has been derived, *are mere symptoms of a primary intestinal disorder*, and that our remedies must be especially directed against this, the essential malady. If, then, we reflect that the local intestinal disease consists either in simple irritation; or in irritation with chronic inflammation; or finally, in irritation with chronic inflammation and disorganization of the mucous membrane of a greater or less proportion of the bowels, according to the grade of violence and duration of the malady, we shall have no difficulty in instituting a rational plan of treatment. In this, as in other affections, our remedial measures must be modified according to the nature of the exciting cause. Thus, where the disease is produced by suppressed perspiration from cold, the restoration and maintenance of the cutaneous exhalation, along with the remedies to be presently mentioned, will be peculiarly proper; where the irritation is produced by vitiated or redundant bile, mercurial remedies are especially applicable; and where a surfeit, or acrid and offensive ingesta have given rise to the disease, laxatives are indispensable in recent cases.

The principal indications in this form of intestinal disease, therefore, are, 1. To remove as much as possible every source of intestinal irritation; 2. To allay the morbid irritability of the mucous membrane of the bowels; and 3. To diminish the determination of the blood to the vessels of the intestinal canal.

In recent cases where there is reason to presume that the intestinal irritation is kept up by vitiated secretions, or other irritating matters lodged in the bowels, recourse must be had to mild purgatives. This is especially necessary where

diarrhœa is the consequence of indigestion, or of the reception into the stomach of indigestible and irritating articles of food; or where the bowels are infarcted, or loaded with fecal matter, as occurs in the marasmus of children. It must be observed, however, that it is only in the earlier periods of diarrhœa, or where the mucous irritation has not passed into the state of *inflammation*, that any material advantage may in general be obtained from purgatives; and even in cases depending on simple irritation, the gentlest laxatives alone ought to be employed. Purgatives are, indeed, very often greatly abused in affections of this kind. Nothing is more common than the repeated use of active purgatives in diarrhœa. An individual becomes affected with looseness of the bowels. If it does not soon cease spontaneously, he takes a purge. The bowel-complaint, however, continues, and convinces him that there is still something left which must be removed. To make himself sure of his object he takes a more active dose; but the tormina and discharges, instead of being mitigated, acquire greater violence. Astonished at the obstinacy with which the offending matter sticks to the bowels, he determines, once and for all, to get rid of the cause of his complaint, and swallows a double dose of the most active cathartic. He now begins to experience tenderness in the abdomen; the tormina and diarrhœal discharges continue; in short, he has developed inflammation, which the most judicious management may not be capable of removing.

We cannot, however, always abstain from laxatives in instances manifestly connected with inflammation of the internal membrane of the bowels. Thus, where phlogosis or a state of irritation closely approaching inflammation exists in connection with an accumulation of feces and vitiated secretions, with a hard and tumid state of the abdomen—a combination of circumstances frequently met with in children—no hopes of procuring relief can be reasonably entertained, until these irritating matters are removed out of the bowels by a course of gentle aperient remedies. Fortunately, in cases of this kind, we may, in general, gain our object in this respect much more readily, by mild, than the more active articles of this kind, when assisted by an appropriate diet. A grain of calomel at night, and a moderate dose of castor oil on the following morning, assisted with three or four laxative enemata during the day, will in general answer well in such cases (*marasmus*), without doing any injury to the inflamed bowels. Castor oil is decidedly the best purgative in cases of diarrhœa, attended with a high degree of irritation or phlogosis. One or two grains of calomel, or three or four grains of blue pill, with from one to two grains of ipecacuanha, may be occasionally given to an adult, both with a view to its aperient effects, and its influence upon the biliary organs, which always become more or less deranged in diarrhœa of protracted continuance. Many writers recommend rhubarb as a suitable purge in this disease; and in recent cases, from irritating matters lodged in the bowels, it will, no doubt, answer all the purposes that may be obtained from a remedy of this kind. In protracted instances, however, where there is high intestinal irritation, or chronic inflammation, it is much inferior to the cold pressed castor oil. From its tonic, along with its aperient powers, rhubarb was formerly thought to be peculiarly suited to the treatment of this affection, under the erroneous notion that diarrhœa is generally the consequence of a relaxation or loss of tone in the intestinal tube. Where it may be deemed necessary to administer an aperient in cases manifestly connected with chronic inflammation, or a highly irritated condition of the bowels, the castor oil may be very advantageously given in union with from fifteen to twenty drops of laudanum.

In all bowel affections attended with inordinate discharges, a preternatural determination of blood takes place to the vessels of the intestines, with more or less torpor of the cutaneous exhalents. This is more especially the case in instances of long standing, and contributes very materially to the support of the intestinal irritation. Remedies which are calculated to counteract this centripetal direction of the humors, are therefore especially proper in affections of this kind. For this purpose, *opium*, in combination with small doses of calomel and ipeca-

cuanha, constitutes an excellent remedy, after the irritating contents of the bowels have been evacuated by suitable laxatives. Opium and calomel have a direct tendency to allay the morbid irritability of the mucous membrane of the alimentary canal, and when given in conjunction with small portions of ipecacuanha, seldom fail to excite the activity of the cutaneous exhalents. In recent cases of diarrhœa, where the discharge depends on simple irritation of the bowels, the exhibition of one of the following pills every four hours, after the operation of a dose of castor oil, will seldom fail to check the complaint.* Minute portions of calomel, too, will frequently arrest the progress of the disease. (Dr. Ayre.) From a sixth to a fourth of a grain of calomel may be given every hour or two. In the diarrhœa of infants, arising from acidity of the primæ viæ, and deficient biliary secretion, this article given in union with two or three grains of prepared chalk, is often peculiarly beneficial, but as the irritation is apt to be transferred from the bowels to the brain in young children, opium may do mischief, by promoting the determination to the head.

Very frequently diarrhœa is induced and sustained by impaired digestion in consequence of a weakened state of the stomach. Here alterative doses of calomel and the use of mild tonics, together with simple, unirritating and digestible diet, will commonly prove beneficial.

Astringent remedies have been much employed in diarrhœa; but where the mucous membrane of the bowels is in a state of high irritation or inflammation, articles of this kind are almost always decidedly pernicious. In instances where the discharge is kept up by a slight degree of irritation and relaxation of the intestinal exhalents, benefit may occasionally be obtained from remedies of this kind; but even in such cases, they may in general be very properly dispensed with. The astringents most commonly employed in diarrhœal affections are kino, alum, acetate of lead, sulphate of zinc, and the infusions of logwood, blackberry-root, the root of geranium maculatum, &c. Astringents should never be resorted to where the tormina are very severe, and there is a tenderness or soreness to the touch in the abdomen. I have repeatedly known great injury done by the use of such articles in the ordinary bowel-complaints of children; and there can be no doubt that, as a general rule, astringents deserve to be reprobated in affections of this kind. Judging from my own experience, opium and ipecacuanha are much more efficacious than astringents, even in instances which may be deemed favorable to the beneficial operation of the latter class of remedies.

What I have hitherto said, refers more particularly to recent cases of diarrhœa, before the intestinal irritation has become fixed or converted into inflammation and its consequences. When the disease assumes a chronic character, it generally becomes exceedingly obstinate, and often resists every mode of remedial treatment. One of the most important measures in such cases is the avoidance of every kind of stimulating aliment. The food should consist wholly of farinaceous fluids, light broths, animal jellies, rice, barley, oatmeal gruel, milk &c.— In all cases, indeed, whether recent or chronic, such a diet is decidedly the most proper; but in the latter form of the disease, it is absolutely essential to success in its treatment.

In some instances of chronic diarrhœa, we may succeed in removing the disease by a rigid adherence to this simple and unirritating diet in conjunction with the employment of small doses of calomel and opium, the occasional use of the warm bath, *leeching*, and counter-irritating applications to the abdomen. I have in several instances derived great advantage from the employment of small doses of Dover's powder, in union with the acetate of lead, according to the

* ℞.—G. opii gr. iii.
Pulv. ipecac. gr. xii.
Calomel gr. ii.
Conserv. rosar. q. s.—M. Divide into 12 pills.

following formula.* Not unfrequently, all the means just mentioned, however judiciously employed, will entirely disappoint us in our attempts to remove the disease. I have known instances of this affection to continue for nine or ten months, although all the foregoing remedies, together with an appropriate diet, had been diligently used. In cases of this obstinate character, the internal use of *balsam copaiva* will sometimes do much good. What I have already said under the head of chronic enteritis, in relation to this remedy, applies fully to the chronic form of the present affection. It is not probable, however, that it can procure any permanent relief in cases attended with ulceration of the intestinal mucous tissue; yet even in cases of this kind, I have known considerable temporary benefit derived from this article. In a case of pulmonary hepatization, with purulent expectoration, attended for nine months with continued and extremely painful diarrhœa, the balsam copaiva emulsion generally gave very considerable relief for four or five days, after which the symptoms recurred with their usual degree of violence, notwithstanding the use of this medicine. On dissection, a number of irregular ulcerations were detected in the mucous membrane of the colon and the lower portion of the small intestines. In a case of chronic diarrhœa of upwards of six months' continuance, I succeeded in effecting a perfect cure by means of this remedy, given to the extent of from thirty to forty drops three times daily, and fifteen drops of laudanum with each dose. In this case, the diarrhœal discharge depended, no doubt, on simple chronic inflammation, without ulceration of the mucous tissue. Dr. Elliotson has lately introduced a new remedy to the notice of the profession, for the cure of chronic diarrhœa, dependent on ulceration, which has been employed with much success at St. Thomas's Hospital in London—namely, the *sulphate of copper in union* with opium. Cases that had resisted almost all the remedies usually accounted the most efficacious in this affection, yielded readily to this remedy. The dose is half a grain twice a day, with a grain of opium, increasing the quantity of the former article gradually to two and even three grains in a day. From the known good effects of weak solutions of this preparation when applied to chronic ulcerations, it is not improbable that its operation in this way may occasionally prove very serviceable in diarrhœa depending on ulcers of the mucous membrane of the bowels; and although the vegetable astringents are always unequivocally injurious in such cases, some benefit may also arise from its peculiar astringent influence on the engorged and dilated capillaries of the mucous membrane. Mr. Kerr speaks very favorably of the effects of the *persesquinitrate of iron* in this affection. Several very long-standing cases yielded in a short time to the influence of this article. The dose, for an adult, is from twelve to twenty drops twice daily.† Whatever internal remedies may be resorted to in cases of this kind, it will always be proper to keep up the regular action of the cutaneous exhalents—and it is especially useful to excite the extreme vessels of the external surface of the abdomen. For this purpose, a broad flannel roller should be constantly worn round the body, and the patient must be particularly careful not to expose himself to the influence of damp and cold weather, and above all, to avoid getting wet and cold feet. All kinds of alcoholic liquors must also be avoided. Mucilaginous fluids, such as infusions of mallows, or flaxseed, or barley water, slightly acidulated with sulphuric acid, form the best drink.

* ℞.—Pulv. ipecac. compos. ℈i.
—— acetat. plumb. gr. vi.—M. Divide into six equal parts. S. Take one every four hours.

† The following is his method of preparing this nitrate: "Take of small chips or pieces of iron wire, an ounce and a half; nitric acid three ounces by measure; water, twenty-seven ounces; muriatic acid, one drachm. Put the iron into an earthenware vessel, and pour on the nitric acid, previously diluted with fifteen ounces of water. Set the vessel aside till the whole of the acid has united with the iron, so as to form a persesquinitrate; then decant the liquid from the portion of iron which remains undissolved, strain and filter. Add the muriatic acid with the remainder of the water, or with as much of that liquid as shall increase the whole solution to thirty ounces.—*Edin. Med. & Surg. Journ.*, vol. xxxvii. p. 99.

Sect. III.—*Cholera*—(*Cholera Morbus.*)

Cholera is an affection of the alimentary canal, characterized by very frequent and violent vomiting and purging, and severe tormina, and cramps in the muscles of the abdominal parietes and extremities. The disease almost always comes on suddenly. Pain, and a sense of tension in the epigastrium, are generally the first symptoms by which it makes its attack. This is soon followed by violent colic pains about the umbilical region, accompanied with exceedingly distressing nausea. In a few moments after the occurrence of these symptoms, vomiting and purging commence with extreme violence, and continue, with but very short intervals, until the system is exhausted, if speedy relief be not obtained. During the intervals between the attacks of vomiting, the patient is usually harassed with continual nausea, and an indescribable feeling of distress in the epigastrium. The alvine discharges are at first thin and watery, and generally with little or no admixture of bile; nor is the fluid ejected from the stomach usually of a bilious character, during the early period of the disease. After the disease has continued for an hour or two, however, the bile begins to make its appearance pretty copiously in the evacuations, and towards the conclusion, the fluid discharged consists, in many instances, almost entirely of bilious matter. As the disease advances, the tormina become more and more severe and continual, and the purging and retching are almost incessant. One of the most distressing affections belonging to this disease are the extremely painful cramps which, in severe cases, occur in the abdominal muscles, and in those of the inferior extremities. In cases of no great violence, the cramps occur principally, and sometimes exclusively, in the muscles of the legs; but in rapid and very severe attacks, the muscles of the trunk, as well as of the upper and lower extremities, are alike affected in this way. The thirst is always exceedingly urgent; but everything received into the stomach is almost immediately thrown up again. As soon as the disease is completely developed, the pulse is small, feeble, irregular or intermitting; the hands and feet become cold, the countenance pale, shrunk, and expressive of great distress; a cold sweat breaks out on the extremities and face; and extreme prostration speedily ensues.

Cholera is one of the most rapid and fatal forms of disease. It seldom continues beyond twenty-four hours, without terminating favorably or fatally; and in many instances it ends in death, in the course of three or four hours, and sometimes in a much shorter period. In the cholera of India, death generally takes place within two or three hours after its commencement. In this extremely fatal variety of cholera, the patient is generally suddenly seized with great prostration, unquenchable thirst, a scarcely perceptible pulse, cold and clammy sweats, cramps in every part of the body, inexpressible anxiety of feeling, extreme restlessness, syncope, excruciating tormina, constant retching, and very frequent stools of a thin, whitish, or starchy fluid. If the patient survive this, the first stage of the disease, which is by no means common, some degree of reaction usually ensues in the course of from twenty to forty hours; and the liver begins to pour out an abundance of dark, thick, vitiated bile, which is discharged in the stools, and which may be regarded as an indication of a favorable crisis in the disease.

Etiology and pathology.—A superabundance of vitiated bile in the stomach and bowels was formerly, and, by some, is still regarded as the immediate cause of this very dangerous malady. The term *cholera** is, indeed, sufficiently expressive of the notions once universally entertained concerning the nature of these affections. Dr. Cullen says, "the matter ejected, both upwards and downwards, appears manifestly to consist chiefly of bile;" and Dr. Gregory, though he rejects

* From χολη, bile, and ῥεω, to flow.

the idea of its dependence on a redundant and vitiated secretion of bile, says that the disease "commences with nausea and unremitted *bilious vomiting*," &c. In truth, almost all writers, up to the time of Dr. Bateman and Dr. James Johnson, mention a copious and vitiated bile as the exciting cause of this affection; but the erroneousness of this sentiment is now well known by all who have kept pace with the progress of pathological science. So far, indeed, from there being a redundant secretion of bile in cholera, there is actually a deficient formation of this fluid, from functional torpor of the liver; and it would appear that the hepatic torpor is in direct proportion to the violence of the disease. No one, indeed, who has attentively observed the early symptoms of cholera, can for a moment doubt the correctness of this statement; for, however abundant the discharge of bile may be after the disease has continued for some hours, this fluid never appears in the evacuations during the early period, or what may be termed the first stage of the disease. The observations and researches that have been published of late years—and they have not been limited—in relation to the pathology of cholera, render it evident that the liver, and indeed the whole system of the portal circulation, are extremely engorged with blood. In the cholera of India, the liver, in subjects who die during the first stage of the disease, is always found enlarged, and greatly engorged with blood, and the internal surface of the stomach and bowels marked with large patches of highly injected and distended vessels. In the cholera of infants, I have never seen an instance in which bile appeared in the evacuations, except after the disease had taken a favorable turn; and in the few dissections which I have witnessed of subjects who had died of this disease, the sanguineous congestion of the liver and mucous membrane of the alimentary canal was very conspicuous. So far, therefore, our knowledge of the pathology of this affection appears to be sufficiently certain; but how are we to account for the extreme irritability of the stomach and bowels, and the excessive vomiting and purging? Can hepatic torpor and congestion in the portal system of vessels give rise to this morbid condition of the alimentary canal? or are we to consider this state of the liver, and the general engorgement of the portal vessels, only as concomitant phenomena, and in no way causative of the characteristic gastric and intestinal affections? From some of the circumstances just mentioned, it would appear, indeed, that the hepatic torpor and congestion have no small share in the production of gastro-intestinal disorder. The fact, that the symptoms almost always begin to abate as soon as the liver resumes its functions, and pours out a copious flood of bile, strongly favors this opinion. Strong sanguineous congestion, and torpor of the liver, are almost always attended with great irritability of the stomach. In the malignant grades of bilious fever, the vomiting, during the first stage, is often incessant, and extremely distressing, whilst the fluid ejected is wholly free from bilious matter. If death takes place in this stage, the liver is always found exceedingly engorged with blood, and the vessels of the stomach are in a similar state of congestion; but when the disease continues until large evacuations of black and pitch-like bile take place from the bowels, an abatement of all the symptoms usually ensues.

With regard to the remote causes of cholera, it is manifest that high atmospheric temperature constitutes the principal agents concerned in its production. In our own climate this affection appears almost exclusively during the warm months of summer; but it is nevertheless probable that elevated temperature acts rather as an essential *predisposing*, than as an *exciting* cause of the disease. Cool and damp night air, or exposure to a current of fresh air after the liver and skin have been over-excited by the previous influence of solar heat and exercise, is one of the most common exciting causes of this affection. When the cutaneous and hepatic functions, while in a state of inordinate activity, are suddenly arrested by the influence of cold, the blood retreats from the surface to the internal vessels; the portal circulation becomes engorged, and the capillaries of the mucous membrane of the bowels strongly congested. This injected or engorged state of the capillaries of the mucous membrane of the alimentary canal gives

rise, we may presume, to morbid irritability of this structure, and, consequently, to the characteristic phenomena of the disease. Much may also depend on the influence of koino-miasmata in the production of this affection. The tendency of this agent to excite and derange the functions of the liver is well known, and when operating in conjunction with high atmospheric heat, as it always does, its tendency to enhance the predisposition to this affection is, no doubt, very considerable.

In some instances of intermitting fever, the paroxysms are ushered in by violent attacks of cholera, the vomiting and purging usually coming on towards the termination of the *cold stage*, and continuing until the febrile reaction is fully developed. Sometimes cholera returns in quotidian paroxysms, commencing with a slight cold stage, and terminating in free perspiration, without any distinct hot stage.

Cholera may also be excited by the direct irritation of indigestible and irritating articles of food and drink; but causes of this kind rarely produce the disease unless the system is predisposed to it by a debilitated state of the digestive organs, or by general relaxation and exhaustion from the influence of high atmospheric temperature.

Cholera Infantum.

The cholera of infants differs in several essential points from the ordinary cholera of adults. It is almost always distinctly febrile, and very frequently commences in a gradual manner, with more or less diarrhœa, of several days' continuance, before the vomiting supervenes. It is also particularly liable to become protracted in its duration, or to assume a chronic form, a circumstance which is scarcely ever noticed in the other varieties of the disease. The liver appears to be as inactive in this as in the preceding form of cholera; for when once fully developed, the evacuations, during the early period of the disease, are wholly devoid of any appearances of bilious matter, consisting either of a whitish, frothy, or of a watery, and almost colorless fluid. If the disease does not rapidly exhaust the vital powers, and terminate fatally during the first few days, the patient begins to emaciate; the extremities become cold; the head and surface of the abdomen extremely warm; the skin dry and harsh; the countenance pale and shrunk; the eyes dull and sunk; and the pulse small, irritated, and frequent. If the disease be not vanquished by proper remedial measures, the little patient, by degrees, becomes somnolent; he sleeps with the eyes half open, rolls about his head when awake, and at last sinks into a state of insensibility and coma, and dies, under symptoms resembling those of the last stage of hydrocephalus. When the disease is very protracted in its course, aphthæ usually appear on the tongue and inside of the cheeks; the face acquires an œdematous appearance; the alvine discharges become so acrid as to excoriate the parts about the anus; and towards the fatal conclusion, spots of effused blood under the cuticle sometimes appear on various parts of the surface.

The duration of this variety of cholera is exceedingly various. It may prove fatal in five or six hours, or continue for several weeks, and even months, until the body is reduced to a state of extreme emaciation, and yet terminate favorably. The majority of deaths take place before the termination of the ninth day.

When death takes place early, in violent and rapid cases, the liver and vessels of the mucous membrane of the alimentary canal are found, on dissection, strongly engorged with blood; "and where the disease had continued for some length of time before death, ulceration, and even abrasion of the lining membrane of the stomach and bowels," are usually discovered.*

The *etiology* of the cholera of infants differs in some important circumstances

* Dr. Condie. Observations on the Pathology and Treatment of Cholera Infantum, &c., in the Philadelphia Journal of Med. and Phys. Sciences, May 1825.

from that of the ordinary form of the disease in adults. Both these varieties of cholera are almost exclusively confined to the hot months of the year; but cholera infantum is vastly more prevalent in large and crowded cities than in the country—a circumstance which does not obtain in relation to the cholera of adults. During a practice of twelve years in the country I met with but two or three cases of this disease in infants. Again, cholera infantum occurs almost exclusively between the third and twenty-fourth months of age; in other words, during the period when the process of primary dentition is going on. There are, therefore, three causes whose concomitant influence is extensively concerned in the production of this variety of cholera, namely, high atmospheric heat, the contaminated air of crowded cities, and the irritation produced by dentition. From the great prevalence of this disease during the hot months of summer in the more filthy parts of crowded cities, it has been supposed that it is of *malarious* origin, and "a mere variety of the bilious fever of our climate, the force of which is turned inwards upon the intestines." (Condie.) In support of this sentiment, it has been alleged by the respectable physician just quoted, that though seldom met with in salubrious districts of the country, "a majority of the children fall victims to cholera infantum in the neighborhood of marshes, or in low, wet, and otherwise unhealthy situations." This, I apprehend, will not be confirmed by the observations of those who practice in the neighborhood of paludal districts. Unquestionably, cholera is much more common, both in infants and adults, in such localities than in high and salubrious parts of the country; and there can be no doubt that miasmata have a considerable tendency to favor the occurrence of cholera, whether in adults or in infancy. If, however, koino-miasmata be the principal agent concerned in the production of this malady, why is the disease so exclusively confined to a particular period of infancy in our cities? And why, we may further ask, does it commence so early as in the latter part of June, and usually acquire its most extensive sway in July, before the ordinary paludal diseases are wont to make their appearance, except here or there, perhaps, a few instances? Let it be observed, too, that we frequently find this fatal disease of infants extremely rife in this city, when scarcely any of the other diseases justly ascribed to the miasmata in question occur among our inhabitants. High atmospheric temperature and the irritation of dentition appear to be the principal remote causes of this affection. But as these causes very seldom produce cholera in infants enjoying the pure air of the country, there must be some other circumstance peculiar to populous cities which especially favors their tendency to develop this disease. This accessory or predisposing cause consists, probably, in the *impure air* of cities, by which the infantile system is rendered irritable, and peculiarly predisposed to suffer disturbances from the irritation of dentition.

It seems to me highly probable that *erethism of the brain*, caused by the irritation of difficult dentition in the peculiarly irritable habit of body just mentioned, is frequently deeply concerned in the production of this malady. Throughout the whole course of the disease the head is always preternaturally warm; and in most instances the child is peculiarly restless and fretful for several days previous to the accession of the disease. The tendency of cerebral irritation to cause inordinate irritability of the stomach and bowels is well known. Diarrhœa is very common, and in general a salutary occurrence during the process of painful dentition. In the commencement of hydrocephalus, great gastric irritability and frequent vomiting are very rarely absent. In concussion of the brain, vomiting is often a very troublesome symptom: and *sea-sickness*, which is often so violent as to resemble cholera, appears to depend entirely on the peculiar cerebral excitement occasioned by the swinging or rocking motion of a vessel at sea. The great tendency of cholera infantum, in its chronic form, to terminate in a state of cerebral oppression and coma, seems also to show that the brain is especially predisposed to inflammation, or to that peculiar morbid condition which constitutes what is usually called acute hydrocephalus.

We may, therefore, presume that in the irritable condition of the system pro-

duced by the influence of a very warm and contaminated atmosphere, dentition causes more or less cerebral irritation, which, being reflected on the stomach and bowels, renders them preternaturally irritable. If, in this state of the alimentary canal, the cutaneous exhalents are over excited and debilitated by high atmospheric temperature, the slightest reduction of temperature, a current of fresh air, or damp night air, will readily cause a sudden torpor of these emunctories. The blood will retreat from the surface to the internal organs, and give rise to engorgement of the vessels of the liver and mucous membrane of the bowels, by which the gastro-intestinal irritability will be still further increased, and the characteristic symptoms of the disease excited.

According to the pathological researches of Professor Horner,* cholera infantum consists in an inflammation of the mucous glands or follicles of the alimentary canal, and not in a common vascular or erythemoid inflammation of the intestinal mucous membrane. In most instances he found the mucous follicles very distinct to the naked eye, and their orifices enlarged and tumid. In the large intestines they were generally larger and more tumid, so as to present the appearance of small grains of white sand sprinkled over the mucous membrane. Sometimes enlarged muciparous glands were more or less ulcerated; and in a few instances he found the follicles "converted into small cysts, of the transparency and size of the itch vesicle, which, on being punctured with a needle, and pressed, readily gave out their transparent fluid." The mucous membrane of the stomach and small intestines was, generally, of a more or less deep sienna color—and, in some cases, portions of this membrane were so soft "that it could be very easily scraped off with the finger nail.'

Treatment of Cholera.

The principal indications in the treatment of the cholera of adults are, to allay as speedily as possible the irritability of the stomach and bowels; to restore the action of the skin and liver; and to determine the circulation from the internal to the external parts. As the progress of this disease is always extremely rapid, the most prompt and energetic means should be at once resorted to, with the view of moderating its violence; and for this purpose we possess no remedies so powerful and certain in their effects as opium, and the application of a large and active sinapism to the region of the stomach and liver. When the disease supervenes soon after having taken a full meal, or some indigestible and irritating articles of food or drink, the patient should be directed to take copious draughts of chamomile or balm tea, or warm water, in order to procure the speedy evacuation of the irritating substances lodged in the alimentary canal. In all cases, indeed, it will be proper, in the commencement of the disease, to allow the patient the free use of bland drinks, both with a view of washing out the contents of the intestinal canal, and of moderating the painful and exhausting effects of frequent ineffectual efforts of vomiting and purging when the stomach and bowels are empty. As soon, however, as the irritating contents of the stomach and bowels are evacuated, a large dose of opium should be administered, and the patient kept from taking any drinks for at least thirty minutes after the medicine is taken. From 80 to 100 drops of laudanum should be given at once; and the same quantity, mixed with a small portion of warm water, thrown into the rectum. If vomiting occurs soon after the first dose is taken, the laudanum should be repeated in doses of from 30 to 40 drops every fifteen minutes, until its influence on the system is fully obtained. At the same time a large sinapism must be laid over the right hypochondrium and epigastrium. Instead of sinapisms, we may resort with nearly equal advantage to active rubefacient embrocations. I have in several instances derived very prompt benefit from the application of the oil of monarda punctata to the abdomen, in conjunction with the internal use of large

* American Journal of Medical Sciences. February 1829.

doses of laudanum. This oil is one of the most active local irritants we possess. When applied in an undiluted state it inflames the skin in a few minutes, and causes exceedingly severe burning pain in the part. The spirit of turpentine may also be used for this purpose, but its effects are less prompt and powerful than those of the ol. monarda. Upon the prompt and free use of opium and external revulsive applications, our chief reliance must be placed. The practice of giving warm spiced brandy, and other powerfully exciting articles of this kind, is highly improper. Brandy may be allowed in the latter stage of the disease, when the prostration is extreme, and it is absolutely necessary to support the sinking powers of the system by potent diffusible stimulants; but if it be given during the early period of the disease, with the view of moderating the excessive vomiting and purging, it will not only generally disappoint our expectations but often manifestly aggravate the symptoms of the complaint. The sedative powers of opium, however, are eminently calculated to allay the extreme irritability of the alimentary canal, and when promptly and efficiently given, will seldom fail to procure complete relief in the course of sixty or eighty minutes. In not a single instance in which I have resorted to this valuable remedy, did it fail to arrest the vomiting and purging within the period just mentioned; and the only fatal case I ever saw, was treated chiefly with warm spiced brandy. If from six to eight grains of opium can be introduced into the stomach, and retained for fifteen or twenty minutes, we may calculate almost with certainty on the speedy subsidence of the disease. When the laudanum is immediately thrown up again, it should be repeated, again and again, until its effects are obtained. I have in the course of an hour given nearly an ounce of laudanum in this way, before the gastric irritability was allayed, without any injurious consequences from its ultimate narcotic operation. Where this medicine is immediately rejected by the stomach, we may obtain its effects by external application, with almost the same promptitude and certainty as if it were retained in the stomach. For this purpose the cuticle should be removed from the epigastrium, which may be speedily done by means of the nitric acid, as practised by Mr. Powell in the cholera of India. Two parts of this acid diluted with one part of water are to be applied by means of a sponge upon the whole region of the stomach; and as soon as the patient feels considerable pain from its impressions, the part is to be washed with a solution of the carbonate of potash. The cuticle may now be easily detached, so as to leave the cutis exposed and raw. Upon this surface, from ten to twelve grains of morphia may be applied, either in the form of a plaster, or by sprinkling the powder over it, and covering it with a piece of linen thinly spread with simple cerate. By this procedure we at once obtain the advantage of a powerful counter-irritating application, and of the full influence of the opium. When the irritability of the stomach and bowels is in some degree allayed, it will be proper to employ calomel in small but frequent doses, with the view of stimulating the action of the liver. Half a grain of this article may be administered every half hour, and continued until the alvine discharges become bilious, or the disease is subdued. Dr. Ayre speaks highly in favor of minute and frequent doses of this remedy in cholera, and there can be no question as to its entire adaptation to the treatment of this affection. Where the disease is very violent and rapid, however, we cannot depend on its operation without the conjoined influence of efficient doses of opium. It may be very advantageously given in union with powdered opium, in the proportion of two grains of each, every half hour, until the narcotic effects of the former are manifested, when the calomel should be continued alone in half grain doses. The warm bath may be used with occasional advantage in the commencement of the disease; and where the exhaustion is great, and the muscles of the extremities affected with severe cramps, much benefit will generally result from rubefacient frictions—particularly from frictions with a strong tincture of capsicum. When the pulse sinks and the extremities become cold, the patient should be wrapped in flannels soaked with hot brandy, and recourse had to the internal administration of diffusible stimuli. One of the

best articles of this kind, according to my own experience, is a solution of camphor in vitriolic ether. Of a solution of a drachm of camphor in an ounce of ether, a teaspoonful may be given every half hour until the reaction is considerably increased. In one instance, where the pulse was scarcely perceptible, and the extremities cold and clammy, this solution, given in the way just mentioned, produced the happiest effects. I have stated above, that drinks should be withheld for some time after administering the first dose of laudanum, in order, if possible, to prevent it from being thrown off before it can produce its impressions on the stomach; with this exception, it will always be proper to allow mild mucilaginous fluids in a warm state—such as barley-water—as long as the vomiting and purging continue; for, as has already been stated, the exhaustion produced by the excessive vomiting and purging, is much less rapid when the stomach and bowels are freely supplied with fluids, than when they are nearly empty, and the evacuant efforts are ineffectual or attended with but small discharges.

After the disease is subdued, the patient should take light and nourishing diet, such as animal broths. It will also be proper, during the period of convalescence, to wear a flannel roller round the abdomen; and to take a few grains of blue pill, with a grain of ipecacuanha, every evening on going to bed; and when the digestive powers remain weak, a tablespoonful of the infusion of colomba, or gentian, or a wineglassful of chamomile tea, with a few grains of the carbonate of ammonia, may be taken three or four times daily.

Treatment of Cholera Infantum.

Although the morbid condition of the liver and alimentary canal, in cholera infantum, does not appear to differ from that of the cholera of adults, yet the treatment proper in the former, differs in several very essential points from that which is best calculated for the removal of the latter variety of the disease. Besides the indications already mentioned for the treatment of ordinary cholera, we have, in the present variety, the important one of obviating irritation and sanguineous congestion of the brain; and hence opium, which is decidedly the most valuable remedy in the cholera of adults, cannot be employed without great hazard of doing mischief in the cholera of infants. Some practitioners, under an idea that the stomach contains offending matter, which spontaneous vomiting is incapable of throwing off, commence the treatment with the exhibition of a gentle emetic; but this practice is not only founded on an erroneous view of the pathological condition of the alimentary canal, but what is still more to the purpose, is generally decidedly injurious.

From what was said above, in relation to the pathology of this affection, it would appear that torpor of the liver and skin, in connection with cerebral irritation, constitute the immediate cause of the excessive irritability of the stomach and bowels. Our principal object, therefore, must be, to restore these two functions; to obviate irritation and sanguineous congestion in the brain, and to determine the blood from the engorged vessels of the liver and mucous membrane of the alimentary canal. To answer these purposes I generally commence the treatment with the application of from ten to twelve leeches to the temples, the exhibition of minute portions of calomel and ipecacuanha, and a large stimulating poultice over the abdomen. I am persuaded, by what I have repeatedly observed in my practice, that great benefit will in general result from local depletion from the head, as well as from the application of blisters behind the ears, or on the back of the neck, in this affection. Within the last four years, I have not treated an instance of this complaint, in which I did not at once apply blisters behind the ears, and in most instances with unequivocal advantage. This at least I may confidently affirm, that since I have adopted this practice, I have been much more successful in the management of this disease than previously. Where the pulse is irritated and the head very warm, leeching at the temples or behind the ears is particularly indicated, and will seldom fail to procure very manifest relief.

In an extremely severe case which I lately attended in a child about eighteen months old, twelve leeches applied to the back of the ears, was almost immediately succeeded with great abatement of the violence of the symptoms. With the view of moderating the gastro-intestinal irritation, and of stimulating the action of the liver, minute portions of calomel and ipecacuanha constitute, I think, the most valuable internal remedy we possess for combating this disease. From one-sixth to a quarter of a grain of calomel in union with half a grain of ipecacuanha, should be given every hour or two, and continued until the evacuations become mixed with bilious matter. Let it be borne in mind, that so long as the liver remains torpid, and the alvine discharges free from bilious matter, the disease may be regarded as still possessing all its violence and dangerous tendency, whatever temporary abatement may occur in the severity of the vomiting and purging. The appearance of bile in the stools, whether green or dark, is always to be hailed as a very favorable sign, and the sooner the liver can be brought to resume its secretory action, the greater in general will be the probability of ultimate success in our attempts to subdue the disease. Ipecacuanha in small doses is a most excellent auxiliary to the calomel, in affections attended with morbid irritability and excessive peristaltic action of the alimentary canal. Its tendency to counteract inordinate action of the bowels, when given in small doses, is well known; and its tendency also to excite diaphoresis, still further enhances its applicability in this and other similar intestinal affections. Where, from a tumid and tense state of the abdomen, there is reason to presume that the bowels are loaded with fecal matter, the quantity of calomel at each dose should be larger, so as to procure its purgative operation. I have occasionally given a grain every two hours until its evacuant effects were procured, and afterwards continued it in doses of about one-sixth of a grain every hour. Dr. Edward Miller appears to have been the first physician who particularly recommended minute doses of calomel in cholera infantum; and under judicious management it is unquestionably a very valuable remedy in this affection. Except under the circumstances just mentioned—namely, a loaded state of the bowels, purgatives are not, in general, advisable in the commencement of the disease. Where the disease continues, however, until the liver, under the exciting influence of the calomel, pours out a large quantity of bile, mild laxatives are highly useful. In a case which I attended during the present season, the vomiting and purging were in a great measure arrested on the third day of the disease. The infant, however, sunk into a state of stupor, from which it was very difficult to rouse it. As the evacuations from the bowels were very dark and small, and the vomiting had ceased, I prescribed a full dose of castor oil. In about two hours after the oil was taken, copious evacuations of a pitch-like matter took place from the bowels; and the little patient was almost immediately freed from the alarming symptoms of cerebral oppression under which it labored. Where the disease comes on gradually, and proceeds slowly, it may perhaps be better to commence at once with purgative doses of calomel, than with the minute alterative portions mentioned above. In cases of this kind, the bowels are, frequently, much loaded with fecal matter, which it is of much importance to evacuate, as speedily and completely as can be done without resorting to very active or irritating purgatives.

At the same time that the means already indicated are employed, external revulsive applications to the abdomen, more especially to the epigastrium and right hypochondriac region, should be used. So far as my own experience enables me to judge, blistering the region of the stomach is decidedly the most efficient application of this kind in the present affection. Before the blister is applied, the part should be slightly bathed with spirits of turpentine, in order to procure vesication as speedily as possible. I have seldom, however, suffered the vesicatory to remain on the skin longer than four hours. As soon as the skin is uniformly inflamed, which in children occurs generally in about four hours, and sometimes much sooner, the cantharides should be removed, and an emollient poultice applied over the whole abdomen, including of course the in-

flamed surface. This will, in a short time, excite the inflamed vessels to pour out a copious quantity of serum under the cuticle, and form a large blister, which should then be opened and dressed with fresh mercurial ointment, prepared without turpentine or other irritating substances. Where the general habit is phlogistic, and the pulse manifestly febrile, leeching both from the head and the region of the liver are important preliminaries to the employment of vesicatories.

The warm bath, also, is an excellent auxiliary in the treatment of this disease; and this measure is especially indicated, when the skin is very dry and harsh, and the pulse quick and tense. While the patient is immersed in warm water up to the neck, it will be proper to apply a napkin wet with cold water to the head. Various other external applications to the abdomen have been recommended, for the purpose of moderating the gastro-intestinal irritability in this affection. Rubefacient embrocations and cataplasms, made of stimulating herbs and spices, may be beneficially applied to the abdomen; and where the disease is violent and rapid in its progress, recourse should be had to the most active articles of this kind—such as sinapisms, ol. monardæ,* spirits of turpentine, and even diluted nitric acid, in the way mentioned for the treatment of the cholera of adults.

I have already stated, as a general rule, that the use of opium is highly improper in this affection. The great tendency to congestion and irritation of the brain, in this species of cholera, renders all medicines of this kind decidedly prejudicial, when given in the early period of the disease, or where, in its advanced stage, symptoms of cerebral oppression are manifestly present. Nevertheless, where the disease assumes a chronic form, and the patient is very restless and wakeful, with a dry, harsh, and withered state of the skin, and there are no particular marks of cerebral congestion, small doses of Dover's powder, in union with minute portions of calomel, will sometimes produce very excellent effects. In a few instances of this kind, I have given half a grain of Dover's powder, with the sixth of a grain of calomel, and two grains of magnesia, every two hours, to a child under two years old, with unequivocal advantage. I must confess, however, that I have witnessed some instances of this kind, in which the employment of this narcotic was speedily followed by more or less stupor and cerebral oppression, without any beneficial effect on the intestinal disorder.

With regard to the astringent and absorbent remedies, formerly so much employed in this affection, we can scarcely pronounce too strong a sentence of condemnation against their use in the acute form or stage of this malady. I am entirely persuaded, that "much of the mortality of the disease has been produced" by the injudicious employment of cretaceous juleps, astringent mixtures, aromatic draughts, and opiates. Where the disease becomes chronic, or continues rather in the form of chronic diarrhœa than of cholera, the milder astringents may occasionally do some good. Thus, I have, in a few cases, known a decoction of the root of the geranium maculatum in milk, procure considerable advantage; but I have much more frequently found it either to produce no manifest impression on the disease at all, or to do injury. The employment of unirritating tonics, in the chronic form of the disease, attended with great debility and relaxation, is much more apt to afford relief, than the use of astringents and absorbents. I have frequently procured considerable benefit, in the advanced periods of the disease, from the employment of a solution of the tartrate of iron. Forty grains of this preparation may be dissolved in two ounces of water, to which half an ounce of the lemon syrup is to be added. Of this, from thirty to forty drops may be given to an infant, four or five times daily. Dr. Robert Jackson speaks very highly of finely powdered charcoal in diseases of the intestinal canal attended with diseased secretions; and Dr. Condie states, that he has used this article with very decided advantage, "in the latter stage of the disease,

* ℞.—Ol. monardæ, ℥i.
Spirit camphoræ, ℥ss.

when it had become in some degree chronic, and the discharges from the bowels were acrid, dark-colored and offensive." From my own experience, I can say nothing of this remedy, but I do not doubt its occasional usefulness under the circumstances just mentioned. From five to ten grains of the powdered charcoal, with four or five grains of rhubarb and a grain of ipecacuanha, may be given every three hours. (Condie.)

When, from the violence and rapidity of the disease, or its long continuance, the exhaustion becomes very great, the extremities cold, and the pulse very small and feeble, internal, as well as external stimulants, become necessary. Under such circumstances, stimulating frictions, together with the internal use of wine-whey, milk-punch, or a weak solution of the carbonate of ammonia, are indispensable to support the sinking energies of the system.

To relieve the colic pains which are apt to occur from flatulent distension of the bowels in the advanced periods of chronic cholera infantum, Dr. Condie strongly recommends a few drops of the spirits of turpentine; and my own experience enables me to speak favorably of this remedy. I have, generally, however, preferred the oil of juniper to the turpentine, and I am inclined to think it more certain in its effects in this respect, than the latter. No remedy has appeared to me so promptly to allay colic pain, and promote the expulsion of flatus from the bowels, as a weak solution of common soot sweetened with sugar.

Particular attention must be paid to the proper regulation of the diet, throughout the whole course of the disease. If the child is weaned, nothing but the blandest liquid articles of food must be allowed. Boiled milk; liquid preparations of arrow-root, tapioca, sago, and rice; thin oatmeal gruel, barley decoction, or a solution of gum Arabic, are the best articles for food and drink in every stage of cholera. In some instances, of a chronic character, I have known beef-tea, or weak chicken broth, to produce a favorable change in the state of the stomach and bowels. In chronic cholera infantum, the appetite sometimes suddenly begins to crave urgently for certain strong and stimulating articles of food, such as salted herring or shad; old bacon; salted and smoked beef, &c., whilst the stomach loathes all the lighter and unirritating articles of nourishment enumerated above. When this occurs, it will be proper cautiously to gratify the newly awakened appetite, however opposed to the ordinary dietetic rules the indulgence may appear to be. "I have seen many children recover," says Dr. Rush, "from being gratified in an inclination to eat salted fish, and the different kinds of salted meat. In some instances they evince an appetite for butter, and the richest gravies of roasted meat, and eat them with obvious relief to all their symptoms." Without these strong instinctive calls of nature, however, it would be highly improper to allow such coarse articles of food; yet where the inclination for them is strongly expressed, it may, and ought to be gratified.

Nothing contributes more to the removal of this disease, than the enjoyment of the pure air of the country. Whenever it is practicable, the little patient ought to be removed into the country; for this change is often sufficient to remove the disease, in a short time, without any other remedial applications. If the circumstances do not admit of a removal from home to a suitable situation in the country, some advantage may be gained, by carrying the patient about in the open air; and still more, by frequent rides into the country in an open carriage.

As *preventive* measures, gestation, or residence in the pure air of the country; the avoidance of cool night air after a very warm day; nourishment at the breast during the process of dentition, or where circumstances render this impracticable, a very light liquid diet—particularly milk, and a thin preparation of arrowroot, with beef-tea, or weak chicken broth, tepid bathing, and lancing the gums as soon as they become swollen by the protruding tooth, are the most important.*

* [Daily scarifications of the gums in a still earlier stage of dentition after the manner prescribed by Dr. Marshall Hall, has become a popular method in this city.—Mc.]

Sect. IV.—*Colic.*

Writers have divided colic into a great many varieties; but as most of these distinctions are mere nosological refinements, I shall notice those only which have a practical bearing.

The most common variety of colic is that which is occasioned by irritating and indigestible articles of food, and which Dr. Gregory, from this circumstance, calls *accidental colic;* but which is more commonly designated by the term flatulent, from the prominent symptoms of indigestion and flatulency which always attend this painful affection.

1. *Flatulent Colic.*

A weak and irritable state of the digestive organs predisposes, in an especial manner, to this variety of colic. In persons so predisposed even the ordinary articles of food will sometimes give rise to the disease; and when food of an indigestible character is taken more or less suffering from colic is almost inevitable. Salted meats—all kinds of pastry—crude vegetables, such as cucumbers, celery, and unripe fruit—sour fruit—fresh and warm bread, &c., are especially apt to excite the disease in persons laboring under weak digestive powers. When articles of this kind are received into the stomach no inconvenience is usually felt until an hour or two after they are swallowed. In some instances, where the stomach is weak and irritable, the food passes into the bowels in an imperfectly digested state; in which case, the colic pains may not come on for several hours after eating, and usually occur most severely about the umbilical region. More commonly, however, the pain commences in the stomach or duodenum, before the offending substances have had time to pass lower down the alimentary canal. At first, the patient experiences a sense of distension and uneasiness in the pit of the stomach, or occasionally in the left iliac region. This is soon followed by a dull, peculiarly distressing, and sickening pain in these parts, accompanied with a feeling of strong distension of the stomach and bowels. The pain now rapidly increases in violence, until it becomes extremely severe. In some cases, the pains continue, with but short *remissions*, for several hours. More commonly, however, they occur in severe paroxysms, with complete, though transient intervals of ease. During the exacerbations, the patient is apt to move to and fro, with the body bent forwards, and the hands firmly pressed against the abdomen. When the stomach is the principal suffering organ, large quantities of air are, from time to time, forced up, and this is generally immediately followed by some mitigation of the pain. When the colon is the part chiefly affected, the flatus sometimes passes off downwards; but this seldom takes place to any considerable extent, until the disease is about terminating. The bowels are always torpid in this affection, and the tongue soon becomes covered with white fur.

Diagnosis.—The diagnosis of this variety of colic is not attended with any difficulty. The relief obtained from firm abdominal pressure—the agitation and writhing motion of the patient; as well as the absence of fever, and the paroxysmal character of the pains, and frequent eructations of flatus, distinguish it prominently from gastro-intestinal inflammation. From *bilious* colic it may be distinguished by the absence of bilious vomiting, as well as of the icterode appearance of the eyes, of the extreme obstinacy of the constipation, and of the headache and bitter taste in the mouth, which characterize the bilious variety of colic. From *cholica pictonum* it is readily distinguished by the hardness and retraction of the abdominal muscles, and the gradual accession of the colic produced by lead.

Prognosis.—Flatulent colic is not attended with much danger, unless it terminates in inflammation of the gastro-intestinal mucous membrane—a termination which sometimes, though rarely occurs. In some instances where the flatulent

distension is very great, it produces paralysis of a portion of the bowels, or destroys, to a degree, the power of contraction, giving rise to habitual costiveness, and an especial tendency to a recurrence of the complaint. It is not improbable, that paralysis of a portion of the intestinal canal, induced in this manner, may be the principal occasion, in some cases, of introsusception or invagination of the bowels. Where flatulent colic is produced by very indigestible and irritating ingesta, it may give rise to rapid inflammation and gangrene.

Treatment.—The treatment of this variety of colic is seldom attended with much difficulty. In slight cases, where the flatulent pains are seated in the stomach, and there is no reason to presume the existence of chronic irritation in the mucous membrane of this organ, we may, in general, soon procure relief by administering some of the carminative and antispasmodic stimulants. Dry frictions with flannels or a flesh-brush, is an excellent means for removing flatulent pains of the stomach. By rapid frictions on the epigastrium, the flatus is generally discharged in copious torrents, and where there is no fixed irritating cause in the stomach that requires removal, we may often, in this way, put a termination to the gastric pains. From five to ten grains of camphor with about thirty drops of vitriolic ether, and the same quantity of laudanum, has frequently afforded prompt relief in my hands. The oil of juniper or the spirits of turpentine will also generally allay the pain in slight cases. Articles of this kind will, in general, give relief where there is no particular irritating cause lodged within the alimentary canal; but where the disease is the consequence of crude indigestible and irritating ingesta—or where it comes on within an hour or two after taking a full meal of stimulating mixed and indigestible food, carminatives and antispasmodics will not only be insufficient, but generally decidedly injurious, unless they are used in conjunction with proper evacuants. Where there is reason to believe that the offending matter is still in the stomach—which may be presumed to be the case when the disease comes on within an hour or two after taking a full meal, recourse should at once be had to an emetic dose of ipecacuanha. To moderate the excessive suffering of the patient as speedily as possible, we may administer some carminative along with the emetic. From twenty to twenty-five drops of the essence of peppermint may be advantageously given in such cases, with about thirty grains of ipecacuanha. When the pain is confined to the bowels occupying the colon, an active purgative in union with aromatics, or with some of the more volatile antispasmodics, ought to be given, and purgative enemata administered at short intervals until the bowels are freely moved. Castor oil with spirits of turpentine is an excellent purgative in colic from the irritation of acrid substances or imperfectly digested articles of food lodged in the bowels. I have often employed this mixture with prompt and complete success. In some instances, however, the sufferings of the patient are so extremely great, that we cannot wait for the operation of a cathartic to procure relief. In such cases, almost the only remedy upon which any reliance can be placed is *opium*, given in large doses. From two to three grains should be given at once, or what is better, an equivalent dose of laudanum. This will always procure relief in the course of forty or fifty minutes; and in many instances of this severe character, nothing but this remedy, in enormous doses, will allay the extreme agony of the patient. The opium, when given in large doses in this affection, does not materially impede the subsequent operation of cathartics—and the administration of a purgative should never be neglected as soon as the violence of the disease is moderated.* When the disease occurs in robust and plethoric habits, venesection

* For this purpose, we may use either castor oil and turpentine, in the proportion of six drachms of the former to two drachms of the latter—or the following pills:

℞.—Extract. colocynth. compos. ℥ss.
Calomel ℈i.
Tart. antimonii gr. i.—M. Divide into ten pills. Take two every hour until the bowels are freely moved.—Or,

℞.—Pulv. jalapa grs. xvi.
Calomel grs. viii.—M. To be taken all at once.

should be practised, in order to obviate the occurrence of inflammation, and to promote the operation of the necessary purgatives. Little or no advantage usually results from the employment of external revulsive applications; yet when, after the subsidence of the colic pains, the epigastrium remains tender to pressure, and the tongue becomes furred in the middle, with a florid appearance of the edges, leeching and blistering cannot be safely dispensed with.

After the disease has been subdued, the patient should confine himself to the lightest and most digestible articles of food for several days.

2. *Bilious Colic.*

There is another variety of colic, which, from the manifest derangement of the biliary organs, and symptoms indicative of a superabundant or vitiated secretion of bile, has with propriety been denominated *bilious colic.*

This variety of the disease appears to depend on the same remote cause which gives rise to intermitting, remitting, and other forms of miasmatic fevers: and it accordingly most commonly occurs during the autumnal months—particularly after a long continuance of a very warm and humid state of the atmosphere.

Before the more urgent and characteristic symptoms of the disease come on, the patient generally experiences headache, loss of appetite, a bitter taste in the mouth, thirst, nausea, and occasionally bilious vomiting. After these symptoms have continued for an indefinite period of time, acute pain in the stomach and bowels supervenes, moving at first from one part of the abdomen to another, though generally most severely felt about the umbilicus. This pain is often intensely severe during the exacerbations. In the early stages of the complaint, pressure on the bowels affords some degree of relief; but as the disease advances, the abdomen becomes tender to the touch. Nausea and bilious vomiting occur more or less frequently from the commencement of the malady; and the patient always experiences a temporary abatement of his sufferings immediately after a spell of vomiting. Although the stomach is morbidly irritable, and extremely apt to be excited to vomiting, yet the bowels are almost invariably extremely torpid, being generally in a state of obstinate constipation from the beginning of the disease. The pulse seldom deviates materially from its natural condition during the early period of the complaint; but in the advanced stage it becomes increased in fullness, force and frequency. In violent cases, the hands and feet are sometimes quite cold during the exacerbations of the pains. About the second or third day of the disease, the eyes and skin become more or less suffused with a yellow tinge; and in some cases, indeed, these manifestations of biliary disorder occur several days before the pain in the abdomen commences.

In cases of great severity, the nervous system usually suffers considerable disturbance—the patient becoming despondent and affected with slight spasmodic twitches in the muscles of the extremities.* Dr. Staley, in the interesting paper on this disease just referred to, observes, that he has sometimes met with cases in which much numbness and tremor of the superior extremities occurred; and he saw one case in which the "arms were so completely paralyzed that all power of voluntary motion was destroyed." Paralysis of the wrists has, indeed, been frequently noticed as an occurrence in this affection, and this circumstance has been adduced as an argument in favor of the identity of this affection with the variety of colic produced by lead. Eructations of flatus are very common in bilious colic; and, as in the former variety of the disease, they are always followed by a temporary mitigation of the abdominal pain.

Causes.—I have already said that bilious colic appears to depend on the same remote cause which gives rise to autumnal bilious fever. Dr. Rush includes this variety of colic among the usual forms of miasmatic fevers; and Dr. Staley ob-

* An Inquiry relative to the Causes, Nature, and Treatment of Bilious Colic. By Dr. Henry Staley, of Maryland.—See *Medical Recorder*, vol. vi. p. 231.

serves, that he has uniformly found "the cases of bilious colic most numerous after a summer remarkable for the prevalence of bilious remitting and intermitting fever." My own observations correspond fully with these statements. In the autumn of 1821, 2, and 3, when bilious remittents prevailed very extensively, I met with a greater number of cases of bilious colic than had previously come under my notice during a period of fifteen years. Although there can scarcely exist a reasonable doubt that koino-miasmata is intimately concerned in the production of this malady—more especially when it prevails, in a degree epidemically; it must nevertheless be admitted, that other causes, of a sporadic character, occasionally give rise to this affection. I have met with cases of strongly-marked bilious colic under circumstances that precluded all ideas of the agency of miasmata.

It is generally believed that the liver is morbidly active in this disease, and that a redundant secretion of bile is one of its most essential conditions. This idea is favored by the circumstance, that from the very commencement the fluid thrown from the stomach is always mixed with a considerable portion of bilious matter. There is much reason, however, to doubt the correctness of this opinion. Dr. Staley observes, with much plausibility, that if we reflect on the quantity of bile which is secreted in a healthy individual, and the obstruction which exists to its passage downwards, from the constipated state of the bowels in this disease, we can have no difficulty in accounting for the quantity of bile discharged by the mouth, although there be a paucity in the secretion. It is not improbable, indeed, that so far from there being too copious a secretion of bile in this disease, there is, in fact, generally a deficiency of this fluid. The functions of the liver are unquestionably deranged, and the bile secreted is, without doubt, vitiated. That this is the case may be inferred from the analogy which bilious colic bears to *cholera*—an analogy which has been particularly noticed by many writers. Dr. Gregory observes, "that bilious colic is closely allied to bilious diarrhœa and cholera, occuring along with them, and apparently differing from them only in some unessential features." The opinion that the liver is in a state of torpor rather than of increased activity, is moreover strengthened by the fact, that so soon as the alvine discharges become bilious, an amendment of the disease usually takes place; and that however frequent the discharges may be, they seldom procure any particular relief when they are devoid of bilious matter. "When bilious stools are not brought away," says Dr. Gregory, "it is common to find chocolate colored motions passed, frequently in vast quantity, reducing the patient to a state of great weakness." Dr. Musgrave, in a valuable paper on this disease, states that he invariably found the liver in a highly congested state, and in the majority of instances there were strong marks of intestinal inflammation and its consequences.*

The etiology of bilious colic does not appear to differ materially from that which is common to cholera, dysentery, &c. The atmospheric heat and miasmata act probably as predisposing causes; and sudden changes of atmospheric temperature, by which the cutaneous exhalents and secretory vessels of the liver are struck torpid, and the blood determined to the internal organs, constitute, perhaps, the principal *exciting* cause of the disease.

Treatment.—The principal indications in the treatment of bilious colic are: to free the bowels of their irritating contents; to allay the morbid irritability of the stomach and intestinal tube, and to restore the healthy actions of the liver. Some writers speak very favorably of the employment of emetics in the beginning of the disease, and there can be no doubt of their usefulness where there is much nausea, without full vomiting in the commencement of the attack. Under such circumstances, the exhibition of an emetic should be among the first measures resorted to for the removal of the disease. Much bilious matter, of a vitiated appearance, is usually thrown off, and considerable temporary relief

* Med. Repository, Nov. 1825.

almost invariably ensues. In cases attended with much *spontaneous* vomiting, it will not be necessary to resort to the use of emetics. In such instances, it will be sufficient to request the patient to take copious draughts of eupatorium or chamomile tea, or some other diluent, in order to facilitate the complete evacuation of the vitiated bile and other irritating matters lodged in the stomach. Where an emetic is indicated, the tartarized antimony will in general answer better than any other article of this kind, on account of its greater tendency to excite the action of the liver and of the alimentary canal. Many writers advise the exhibition of purgatives, as soon as the stomach has been well freed of its irritating contents. But in the majority of cases, the stomach is so extremely irritable, that medicines of this kind cannot be retained a sufficient length of time to enable them to act on the bowels. As the early evacuation of the intestinal canal, however, is all-important, measures should be immediately taken to allay the gastric irritability, so as to enable us to administer a cathartic with a prospect of advantage as early as possible. So far as my own experience enables me to decide, *calomel* is decidedly the best internal remedy we possess for preparing the stomach for the reception and retention of purgatives. Given in small and frequent doses, in conjunction with the application of sinapisms or epispastics to the epigastrium, this mercurial will seldom disappoint us in allaying the irritability of the stomach sufficiently to enable us to administer with effect the necessary cathartics. What renders this remedy still more useful as an antecedent measure to the use of purgatives, is its well known powers to correct functional disorder of the liver, as well as its tendency to co-operate as an aperient with the purgatives which are to follow. After the stomach has been freed of its contents, either by spontaneous vomiting or the operation of an emetic, half a grain of calomel may be given every half hour, at the same time that a large epispastic is applied to the region of the stomach and liver, and continued until the gastric irritability is moderated. When this is accomplished, a full dose of some active purgative should be administered; and for this purpose we may give from fifteen to twenty grains of calomel, followed in about three hours with an ounce and a half of castor oil, or a draught of a strong infusion of senna and manna. In some instances, however, none of the usual purgatives will be retained, notwithstanding the previous employment of small doses of calomel and counter-irritating applications to the epigastrium. Where this is the case, it is best to depend on calomel alone, with the view of procuring the evacuation of the bowels. "When the gastric irritability is very great, calomel," says Dr. Staley, "combined with gum Arabic, will be retained, when every other cathartic will be rejected." This corresponds entirely with my own experience. I have, in several instances, ultimately procured free alvine evacuations by administering from five to six grains of this mercurial every three or four hours, until from twenty to thirty grains are taken, and then assisted by repeated purgative enemata. The employment of enemata should, indeed, always accompany the use of purgatives in this affection. An excellent injection for this purpose is the following mixture of castor oil and turpentine;* or we may use a strong infusion of senna and Glauber's salts. As soon as the bowels are freely evacuated, a full dose of opium ought to be administered. This valuable narcotic allays the irritation and spasmodic contraction of the intestines; and when given in combination with calomel, it does not impede the subsequent operation of cathartics, and tends, in no small degree, to equalize the circulation, and to excite the cutaneous and hepatic functions. When the obstinacy of the disease is very great, and the bowels resist the effects of purgatives, the calomel, with an occasional dose of opium, should be given with a view to its constitutional influence.

* R.—Ol. ricini ℥iss.
Spir. terebinth. ℥ss.
Infus. sem. lini. Oj.
Sapo Venet. ℥i.—M.

In general, cathartics will operate freely as soon as the mercurial influence is manifested by the soreness of the gums. A general mercurial action has, in fact, a most beneficial influence upon the disease, whatever may be its grade of violence; and in prescribing calomel in the commencement of the disease, with a view of its purgative effects, we must not lose sight of the more permanent and equally important influence, procured by its specific effects upon the system, and particularly upon the liver. Deranged hepatic function constitutes, probably, the foundation of the malady; and the removal of this morbid condition should be held a primary object in the treatment. After the bowels have once been freely evacuated, we must by all means endeavor to keep up regular alvine evacuations throughout the subsequent course of the disease. For this purpose, castor oil, or infusion of senna and manna, with an occasional dose of calomel, and the daily use of one or two purgative enemata, will in general answer very well.

In robust and plethoric subjects, or where the pulse is vigorous and tense, and the tenderness to abdominal pressure considerable, blood-letting is a very important auxiliary remedy in this affection. It not only tends to moderate the irritability of the stomach, and to favor the regular operation of the necessary purgatives, but what is still more important, it lessens the liability to inflammation, which, in plethoric and robust habits, is always very considerable in this affection. When the pulse is vigorous, it will be best, at once, in the commencement of the disease, to draw the blood to the extent of making a decisive impression on the system; and the operation may be advantageously repeated whenever the state of the pulse, and other symptoms, indicate its propriety, at every stage of the disease.

Epispastics, sinapisms, and warm fomentations, also, are valuable auxiliaries to the remedies already mentioned. When the irritability of the stomach is very great, or when the epigastrium and abdomen are very tender to the touch, a large epispastic should be applied over the region of the stomach—having previously practiced an efficient blood-letting—and an emollient cataplasm laid over the lower part of the abdomen. These applications assist, in no inconsiderable degree, to allay the irritability of the stomach; and they are especially useful, also, to obviate intestinal inflammation—an occurrence which it must always be our principal aim to prevent.

When, in the beginning, the fluid thrown from the stomach is of an acrid quality, alkaline remedies should be administered. Calcined magnesia may be given either in union or in alternation with other purgative medicines; or from twenty to thirty grains of the bicarbonate of potash, dissolved in a draught of senna and manna.

The *warm bath* occasionally affords considerable relief in violent cases of this affection; and warm fomentations to the abdomen may be very beneficially used.

After the disease has been subdued, much care is necessary on the part of the patient, in relation both to diet and exposure. There are few diseases which are so apt to be re-excited by even slight errors in either of these respects, as the present one. For eight or ten days after an attack of this disease, the diet should be of the lightest and most digestible kind. Rice, sago, dry toast, beef tea, &c., should be used for three or four days, after which small quantities of the most digestible meats may be allowed. It is particularly important to avoid getting cold and damp feet. To lessen the liability to a relapse, it will be proper to wear a flannel roller round the abdomen for some time after the subsidence of the disease; and the patient must be particularly cautioned against drinking very cold water, during the first three or four days of convalescence.

3. *Colica Pictonum.*

This variety of colic has been described under a diversity of names—as dry gripes; Devonshire colic; colica pictavensis; c. saturnina; c. damnoniensis; rachialgia metallica; painters' colic, &c. It generally makes its approaches in a

very gradual manner—commencing with symptoms of gastric derangement, such as irregular and weak appetite, foul eructations, languor, slight nausea, constipation, with transient pains, and a feeling of weight and tightness in the abdomen, more or less drowsiness, and disinclination to mental and corporeal exertion. By degrees, the pain in the epigastrium and umbilical region becomes more and more severe and constant. The abdomen is hard, retracted, and somewhat tender to pressure, the bowels immovably torpid, and the stomach, in most instances, very irritable. The pain in the abdomen suffers occasional remissions, but except for a moment after vomiting, and in mild cases, no perfect intermissions take place, as in the other varieties of colic. The exacerbations of the colic pains are protracted in duration, and exceedingly agonizing; and during the first two or three days the retching and vomiting is generally very distressing, although a momentary mitigation is usually experienced immediately after the contents of the stomach are ejected. In violent and rapid cases, or what may be called the acute form of the disease, the pains extend from the umbilical region upwards to the chest and arms, and downwards to the pelvic viscera, giving rise to paroxysms of violent pain in the region of the bladder and rectum, with much difficulty of voiding urine, and a distressing sense of weight, constriction, and bearing down in the lower part of the abdomen. During the exacerbations, the anxiety and agitation are extreme—cold sweats break out on the extremities and face; the countenance is pale, contracted, and expressive of great suffering; and in some cases of very great violence, partial syncope, delirium, convulsions, paralysis of the wrists, and severe pains in the extremities occur. When remedial measures fail to make a favorable impression on the disease, the vital energies at last begin to sink; the abdominal pains abate; the stomach becomes extremely tender and puffy; the thirst unquenchable; vision imperfect; and finally, œdema of the feet, drowsiness, a pale, livid hue of the face, and occasionally suppression of urine, and more or less tenesmus, with great dyspnœa, ensue; and the patient dies under symptoms of apoplexy, or in a state of syncopic insensibility.

Colica pictonum, if not subdued by an appropriate treatment, or if the remote cause continues to act on the system, or the patient has already suffered one or two attacks of the disease, is particularly apt to assume a chronic character, and to become associated with a variety of fixed and peculiarly distressing affections. The excretory and nutritive functions become impaired; the mental and physical energies torpid; the capillary circulation extremely inactive, giving rise to a pale, sallow, and leaden hue, and a shriveled, dry, and harsh state of the surface of the body; the temper becomes irritable, desponding, taciturn, and gloomy; the countenance lurid, and expressive of deep suffering; the body emaciates; *the forearms become wasted and palsied;* the abdomen exceedingly hard, painful to pressure, and tumid; the legs œdematous, with pains in the joints, particularly in the ankles and toes, and great tenderness of the soles of the feet. The patient is extremely restless at night, his vision becomes weaker and weaker, the œdema extends up the legs, and the abdomen enlarges with dropsical accumulations. In some cases paraplegia, epilepsy, mania, or total imbecility of mind ensue; and the patient is at last reduced to a state of complete exhaustion and emaciation, and dies under symptoms of apoplexy, or of dropsical effusion into the cavity of the thorax, pericardium, &c.

On post-mortem examination, traces of inflammation, with patches of disorganization, almost always occur in the mucous membrane of the stomach and intestinal canal. Frequently, portions of the intestines are so contracted as scarcely to admit the passage of an ordinary sized quill; and occasionally the stomach, and whole track of the bowels, are in a state of preternatural contraction. The vessels of the abdominal and thoracic viscera are generally very turgid with blood; but the muscular structure everywhere exhibits a pale and exsanguinous appearance. The omentum is often marked with livid spots. M. Thomes, a late French writer, states that, in the dissection of eleven persons who had died of this disease, he found the meninges of the brain strongly injected,

together with softening and other morbid appearances of the cerebral structure, with serous or sanguineous extravasations between the membranes.

Causes and nature.—Lead, in whatever way and form it may be brought to act on the system, is almost the only well ascertained cause of this variety of colic. It would seem that the fumes of melted lead and the white oxide of this metal are most apt to act injuriously on the animal system, and to give rise to this extremely distressing affection. It has been said that the acetate of lead is incapable of producing this disease, and that no apprehensions need be entertained on this account in prescribing the internal use of this article. It must be admitted, indeed, that the acetates manifest a much less deleterious tendency in this way than any of the other forms under which this metal may exert its poisonous influence on the system. It would appear that the tendency of lead to produce colic is not confined to the human species. It has been distinctly noticed, that in the neighborhood of smelting furnaces and white lead manufactories, pigs, poultry, and other animals, occasionally become affected with a similar disease. Plumbers, painters, glaziers, gilders, the workers in lead mines and in white lead manufactories, are most exposed to the influence of this poison, and of course almost peculiarly liable to this disease. Formerly it was the practice, in some parts of Europe, to put *litharge* into new made wine, for the purpose of rendering it palatable, or to convert acid into sweet wine. This gave rise to the extensive prevalence of this form of colic in some districts; and it is from its endemic prevalence at *Poitou*, in France, from this cause, that the disease obtained the name of *colica pictonum*.*

It has been contended, nevertheless, that other causes are capable of producing this variety of colic. Crude wine, fresh cider, and other drinks, acidulated with fresh vegetable juices, are mentioned as possessing a tendency, under otherwise favorable circumstances, to produce this disease; but the correctness of this opinion has, I think, with great propriety been doubted; for if the circumstances attending the occurrence of instances of this kind are accurately investigated, it will, perhaps, generally be found that in such cases these drinks had been tainted with lead employed in some part of the machinery or vessels made use of. Without doubt, such beverages may give rise to severe colic; but we have no satisfactory evidence that they are capable of producing the protracted train of distressing symptoms which are known to arise from the poisonous influence of lead. Larrey, and some other late writers, assert that atmospheric vicissitudes, in conjunction with malaria, are a frequent source of this form of colic; but it is probable that, when produced by these causes, the disease does not differ from the preceding variety—namely, *bilious colic*. It has, indeed, been maintained that the affections called bilious and lead colic are essentially the same; but, although the former often bears a very close resemblance, in its course and phenomena, to the latter, the more decided manifestations of biliary derangement in the former, and the great aptitude of the latter to pass into a chronic state, and to become complicated with various affections of a most distressing character, among other distinctive circumstances, seem to indicate a radical distinction between them. Of the nature or proximate cause of colica pictonum there is but little known of a satisfactory character. That the nervous system is prominently affected is very evident; but whether the ganglionic or the cerebral nerves are the seat of the primary irritation is by no means evident. M. Thomas, to whose dissections I have already referred, conceives that the primary location of this affection is in the brain; but the facts upon which he grounds this opinion—namely, the very obvious traces of high vascular congestion, and other organic affections of the brain which are frequently detected on post-mortem examina-

* [A new pathognomonic sign has of late been much insisted on by foreign physicians, i. e., a lividity or blueness of the gums, or rather of that portion of the gums which is immediately adjacent to the teeth. If lead has been in any way introduced into the system it is supposed that it must always discolor the gums in this way.—Mc.]

tion—are by no means satisfactory, since they may be, and I presume are, rather the ultimate effects than the causes of the malady. The disease may be compared to a *tetanic spasm* of the intestinal canal, the result, probably, of a primary morbid condition of the ganglionic nerves, gradually extending to the nerves of relation.

Mr. Teale thinks that colica pictonum always depends on a primary irritation, or neuralgia of the spinal and sympathetic nerves. This corresponds nearly with the sentiments of Andral and Lobstein on this subject. The former of these pathologists observes that lead colic is a nervous disease, in which the spinal marrow and plexus of the great sympathetic appear to be particularly implicated.

Treatment.—The indications for prescribing in this affection are: 1, to allay the pain and spasm of the bowels; 2, to evacuate the intestinal canal; 3, to correct and excite the hepatic and intestinal secretions; and 4, to obviate the occurrence of inflammation in the stomach and bowels.

As the tendency to intestinal inflammation in this affection is always very considerable, it will be proper, in the first place, to reduce the momentum of the circulation, more especially in robust and plethoric subjects. If the pulse is hard and full, a vein should be immediately opened, and the blood suffered to flow until a manifest impression is made on the action of the heart and arteries. Blood-letting does not appear to exert any direct influence over the violence of the symptoms, but it is obviously proper as a means to lessen the chances of the supervention of inflammation, and it tends, in no inconsiderable degree, to render the operation of the other remedies more certain and beneficial. As soon as the action of the pulse has been moderated, we must prescribe with a view of allaying the pain and spasm of the intestinal canal; for unless this be effected, little or no advantage can be gained from the use of purgatives, on the free operation of which much of our ultimate success depends. For this purpose *opium* is decidedly the most valuable remedy we possess. When given in large doses, it not only allays the spasm and excruciating pain in the bowels, but by these effects it contributes also very greatly to the free operation of cathartics. In order to excite the action of the liver, and to obtain the general mercurial influence on the system as speedily as possible, as well as to predispose the bowels to be properly affected by the subsequent purgatives, the opium should be administered in union with *calomel*. Two grains of opium, with five or six grains of calomel, should be given every two hours until the abdominal pains are removed. After the pain has been thus allayed, the calomel should be continued, at the same intervals of time, in two or three grain doses, with half a grain of opium, until the gums begin to manifest the mercurial influence. As soon as this is perceived, recourse must be had to active purgatives, and it will scarcely be advisable to resort to them before the general mercurial action has been obtained; for, previous to this the most active cathartics will almost universally fail; and what is still more unfavorable, they frequently give rise to severe vomiting and gastric distress, with but very small or no alvine evacuations, however vigorously urged. When, however, the mercury has affected the system, the skin generally becomes moist and of a natural temperature, and a full dose of an active purgative will rarely fail to procure free evacuations. I have repeatedly given opium and calomel for three or even four days before an attempt was made to evacuate the bowels; and I have had much reason to be satisfied with the result. Castor oil in union with the spirits of turpentine constitutes a very excellent purgative in cases of this kind. An ounce of the former with three drachms of the latter may be taken at once, and half this quantity repeated afterwards every hour until the bowels are freely moved. I have not, in a single instance, failed to procure free evacuations from the administration of this mixture, after the gums had become affected with the calomel. A strong infusion of senna and manna, with a portion of Epsom salts dissolved in it, will also, in general, answer well as a purgative in this affection; but it is less certain, I think, than the oil and turpentine,

and much more apt to produce very severe tormina during its operation. If the pain returns, after the operation of the purgatives, recourse should be again had to opium, and the mercurial impression must be maintained by the regular administration of a few grains of calomel every three or four hours. Where the torpor and spasm of the intestinal canal offer a very strong resistance to the operation of cathartics, purgative enemata are very useful auxiliaries. A strong infusion of senna, with an ounce of Glauber's salts dissolved in it; or an emulsion formed of two ounces of castor oil, with half an ounce of the spirits of turpentine, and a pint of warm flaxseed tea, should be repeatedly thrown into the rectum until the bowels begin to discharge themselves freely. After the use of large doses of opium and calomel, however—more especially when a general mercurial excitement has been established—the difficulty of moving the bowels is seldom considerable.

External counter-irritating applications rarely contribute materially either to mitigate the symptoms or to shorten the duration of their progress. Nevertheless, where from the violence and obstinacy of the disease there is reason to apprehend the supervention of gastro-intestinal inflammation, vesicatories, or pustulation with tartar emetic ointment, and leeching, ought by no means to be neglected. From some reports that have been published in the French journals, it would seem, indeed, that leeching is capable of doing much good in this affection. Récamier cured a case veay promptly by the application of fifty leeches to the abdomen, after the *routine* treatment pursued in the Hospital La Charité had been ineffectually employed.* Warm fomentations and the warm bath may also be used with occasional advantage in this variety of colic.

Alum is much praised by Richter and other German writers as a remedy in this affection; and I have myself used it in some instances with remarkable success. Richter declares that it will sometimes procure relief where opium and all other remedies fail; and from a case which I treated lately, I am inclined to think that there is much foundation for this assertion. In this instance I employed venesection, vesication to the epigastrium, and opium with calomel in

* This method of treating colica pictonum—which is denominated "*Traitément des Pères de la Charité*," consists in the following course of management:—On the first day, a purgative enema, made by boiling half an ounce of senna in a pint of water, and adding four ounces of the sulphate of soda, and four ounces of antimonial wine, and during the day the patient takes occasional draughts of a drink made by dissolving an ounce of the sulphate of magnesia, and three grains of tartar emetic, in two pints of cinnamon water, with the addition of an ounce of the syrup of buckthorn. At five o'clock in the evening an enema is administered, consisting of eight ounces of the oil of walnuts, suspended in twelve ounces of port-wine. Three hours afterwards, a bolus, containing one grain of opium and a drachm of treacle, is given. On the second day, the "*eau benite*," an emetic potion, consisting of six grains of tartar emetic, dissolved in eight ounces of tepid water, is given; the half at first, and the remainder in half an hour. When the vomiting has subsided, draughts of a diaphoretic ptisan are given during the rest of the day, made by putting china root, lig. guaiac. and sarsaparilla, of each a drachm, into two pints of water, and boiling it down to one. An ounce of sassafras, and half an ounce of liquorice root are then added, and the mixture gently boiled and strained. At night, the above anodyne enema and bolus of opium are again administered. During the third day the patient drinks two pounds of the diaphoretic ptisan, to which, however, an ounce of senna is added—the whole being taken in four equal portions; and besides this, he continues the use of the ptisan without the senna. In the evening the above-mentioned purgative enema, composed of a decoction of senna, sulphate of soda, and antimonial wine; in two hours afterwards the anodyne enema, (walnut oil and port wine;) and in two hours more the anodyne bolus.

The fourth day is commenced with a purgative potion, composed of two drachms of senna, boiled from eight down to six ounces, to which are added half an ounce of the sulphate of soda, a drachm of powdered jalap, and an ounce of the syrup of buckthorn; and the patient drinks the diaphoretic ptisan mentioned above, and in the evening, the oleaginous enema and the anodyne bolus are repeated. All the fifth day is occupied with the sodorific laxative ptisan used on the third day; with the purgative enema (used on the first day) at four in the afternoon; the anodyne (oil and port-wine) enema, at six o'clock, and at eight the opium bolus. The treatment is adopted by Ratier, and it is said that it accomplishes many cures. Dr. Lerminier also follows this practice rigidly, and with no inconsiderable success. Pinel calls this method "*empirisme consacré par une longue suite de succès.*"

very efficient doses. The pains and intestinal spasms were but moderate whilst the patient was under the influence of the opium, and on the evening of the third day very free evacuations were produced from the bowels by the castor oil and turpentine purge, assisted by enemata of senna infusion. On the following morning, however, the patient's sufferings were as great as at first; and although they were again allayed by opium, and the gums were manifestly affected by the calomel, it was evident from the general distress and firmness of the abdominal parietes, that the disease was not subdued. Another pretty free action of the bowels was obtained by the oil and turpentine, with the assistance of purgative enemata; but the patient's sufferings were still extremely severe on the following day. I now resorted to the alum, giving twenty grains of it with a grain of opium, every three hours. On visiting my patient next morning, I found him almost entirely free from pain, and was informed that he had five or six very copious evacuations during the night. He recovered rapidly under the use of purgative enemata, and an occasional dose of castor oil, with small doses of calomel and opium. M. Kapeler has for many years been in the habit of employing alum in this affection, in the Hospital St. Antoine; and M. Montancaix has lately published nine cases, which furnish very striking evidence of the usefulness of this practice.* This remedy was first employed by Grashuis,† and it is highly praised by Lentin.‡

Since the third edition of this work was published, I have witnessed the good effects of alum in two very severe cases of this species of colic. In one case, ten grains of alum with half a grain of opium, were given every two hours. In about twelve hours, the patient was almost entirely relieved, and under the further use of the alum, without the opium, his health was completely restored. In the other case I gave fifteen grains of alum, singly, every three hours, with the same favorable result. Alum is, without doubt, a remedy of great efficacy in this obstinate and painful affection, though, I believe, but rarely employed for this purpose by the physicians of the United States.

It is said that cold water dashed on the body and limbs of the patient has occasionally excited the action of the bowels after opium, calomel, the warm bath, and purgatives had been ineffectually used.

For the removal of chronic colica pictonum, or the various distressing consequences of this affection, mercury is, without doubt, the best remedy we possess. It should be given to the extent of producing gentle ptyalism; and this should be regularly maintained for three or four weeks, during which the patient ought to go into the warm bath daily, and avoid with all possible care the influence of cold or atmospheric vicissitudes. Dr. Clutterbuck and other writers of eminence have found salivation to be the most effectual means we have for the cure of the paralysis of the wrists, produced by the poisonous influence of lead. The nitrate of silver has also been used with success in paralysis from this cause. We may commence with half a grain three times daily, and gradually increase it to the extent of five or six grains in the twenty-four hours. When it causes purging, which it appears to be apt to do in this affection, it should be given in union with a small dose of opium.§

During the treatment of this variety of colic the patient should take freely of fat animal broths, or chicken water; and it is particularly important that he should avoid drinking cold water or stimulating fluids. To prevent the recurrence of the disease, it is of course absolutely necessary to avoid the influence of its remote cause; and therefore to relinquish the employments which render the exposure to this cause unavoidable, such as painting, glazing, manufacturing white

* Arch. Medic., Novembre 1828.

† De colico pictonum tentamen. Amstel., 1752. Ejusd. Appendix decadem observationum sestens, 1755.

‡ Memorab. circa ærem, vitæ genus, sanitat. et morbos, Clausthaliens, p. 115.

§ Dr. Roberts. Med. Transactions, vol. v. art. 5.

lead, &c. The utmost care is necessary not to take crude and acid articles of food and drink, and to avoid the influence of a humid and cold atmosphere for a considerable time after recovering from an attack of the disease. The free use of fat and oily articles of diet is said to counteract, to a very considerable extent, the poisonous influence of lead. Fat pork, and the daily use of two or three ounces of sweet oil in the morning on an empty stomach, will often protect the system a long time from the injurious effects of this poison; and those who are employed in lead mines, and in the manufacture of the preparations of this metal, are fully aware of the protecting influence of such articles of food, and generally use them very freely.

Sect. V.—*Ileus.*

Ileus very generally depends on the intussusception, invagination, or inversion of one portion of the intestinal tube into another. This unnatural position of parts induces irritation, which eventuates in spasmodic contraction of the muscular coat of the intestine, thus constricting the calibre of the enclosed gut, and preventing the regular passage of the feces. The invagination commonly occurs at the termination of the small in the large intestines, the ileum and cæcum being enveloped within the colon. It, however, frequently happens also in other parts of the intestinal tube, and it is by no means rare to see invaginations in several places in the same individual. Invaginations of the small intestines frequently take place in children, and occasion but slight and temporary inconvenience. Ileus is not, however, invariably dependent on intussusception or mechanical obstruction of the intestinal tube. M. Corbin has related a case in which there was copious stercoraceous vomiting with colic pains and constipation, which was finally relieved by the purgative operation of a large dose of scammony. Cases, attended with painful stercoraceous discharges from the stomach, have occurred, in which the fluids which were injected into the rectum were quickly vomited up, "showing that there was no permanent or organic obstruction in the bowels." An instance is mentioned in the *Medico-Chir. Rev.* (April 1831), in which "six or seven pints of warm water could be injected into the bowels, and soon afterwards it would be ejected by the mouth. No motion could be procured by the anus." Such cases may depend on an indomitable inversion of the peristaltic action of the bowels.

Causes.—This disease may be produced by everything which may tend to excite irritation or spasmodic action in the stomach and bowels. Among these may be enumerated irritating and drastic cathartics, emetics, or indigestible substances taken into the stomach—such as coins, glass, cherry or peach stones, and unripe fruit. Ileus is also occasionally produced by hernia, by wounds, or other injuries of the abdomen, by cold externally or internally applied, by intestinal calculi, by organic derangements of the alimentary canal, or by anything which either directly or indirectly tends to contract or close the intestinal tube.

Symptoms.—The indications of an attack of ileus are in some instances very insidious, and the organic cause or affection may have continued months or perhaps years unsuspected. It usually, however, comes on suddenly and without any premonition, by violent spasmodic and paroxysmal pains in the abdomen, eructations of wind, jactitation, frequent and ineffectual attempts at stool, distension of the abdomen, and all the symptoms of spasmodic colic. The bowels are constipated, although a discharge of the large intestines below the invaginated part may be accomplished by means of enemata or by nature. The stools are often mixed with, or consist entirely of coagulated blood. Upon examination of the abdomen, a hard, irregular, convoluted tumor may often be discovered, showing the situation, and perhaps the extent of the invagination. To the symptoms detailed, succeed obstinate constipation, hiccup, vomiting at first of the contents

of the stomach, and ultimately of stercoraceous matter. The symptoms of inflammation may supervene upon those of spasm, in which case the disease will become greatly aggravated, and the life of the patient put in imminent danger. Should the spasmodic constriction and inflammation of the intestines be sufficiently severe, and continued for any great length of time, gangrene and mortification of the bowel will be the result, which will be indicated and accompanied by cessation of pain, prostration of strength, and all the distinguishing and alarming symptoms of mortification. The invaginated portion, however, becoming gangrenous, sometimes sloughs off, and cases of recovery in this manner have been recorded. Twenty years ago I saw a case of this kind, in which, by the efforts of nature, adhesions formed, several inches of the bowel sloughed off and passed away by stool, producing immediate relief and a rapid recovery. Nature may also accomplish a favorable termination of the disease by overcoming the constriction, and procuring the disengagement of the enclosed intestine.

Diagnosis.—The diagnosis of this disease is exceedingly difficult and uncertain. Attacking suddenly, with great violence, and without any premonitory symptoms, it is apt to be mistaken for spasmodic colic, colica pictonum, cholera morbus, or tympanitis. On the other hand, insidious as it frequently is, and accompanied with symptoms uncertain, and common to some other complaints, its very existence is often unsuspected, and it may easily be mistaken for other diseases. So uncertain are the diagnostic symptoms, that John Hunter, who paid particular attention to this subject, has declared that its existence could never be satisfactorily ascertained during life. Violent and spasmodic pains occurring in paroxysms, however, with long-continued and obstinate constipation; fecal vomiting; distension of the abdomen; with a hard convoluted tumor about the arch of the colon, will indicate its presence with a considerable degree of certainty.

Prognosis.—Ileus is always dangerous. Occurring in robust and plethoric habits, inflammation, followed by gangrene and mortification, is very apt to ensue. In delicate and irritable habits, the spasmodic constriction is carried to a great extent, and is productive of effects equally dangerous. The spasmodic or inflammatory action may, however, in some instances, be overcome, and the disease relieved. The skill of the physician, however ably and scientifically directed, will generally fail, in which case nature sometimes comes to our aid, and brings about results as unexpected as they are salutary.

Pathology.—It has been said that ileus is a spasmodic disease, and that inflammation, gangrene and mortification are the consequences of the pre-existent spasm. In a late publication upon "the diseases of the stomach and bowels," Abercrombie has advanced a new theory upon this subject. Having observed in a great number of post-mortem examinations, that distension of the bowel above the invagination was a uniform occurrence, he conceives the distension to be a paralytic affection of the intestine, in consequence of which the fecal matter cannot be propelled onward through the canal. The intussusception has, according to this theory, nothing to do with the disease. Ingenious as this theory undoubtedly is, facts are wanting to support its claims to our notice. A careful review of the disease will convince us that it is entirely inadequate to account for the origin, symptoms, causes, effects and treatment of this disease. The spasmodic nature of ileus can admit of but little doubt. We have seen that ileus is produced by all the causes which give rise to spasmodic diseases generally—that it is indicated by symptoms peculiar to this class of affections; and we shall soon observe that every plan of treatment which has been pursued with any prospect of success, has been based upon the position of the spasmodic nature of ileus. The remedies which Abercrombie himself proposes, are such as are eminently calculated to allay spasmodic action, without any view to the paralytic affection of the bowel.

Dissections exhibit very clearly the pathology of ileus. The disease appears to expand its whole force upon the intestines about the intussusception. This

intussusception is very satisfactorily presented to our view. One portion of the bowel is drawn within another, and is there firmly constricted—so much so, that in some instances considerable difficulty is experienced in extricating it. Surrounding this invagination, the marks of inflammation are everywhere apparent. In some parts, and particularly at the constricted point, gangrene and mortification will generally be detected. Above the intussusception the intestine will be found distended by feces or flatus, which had been prevented from passing through the constricted portion of the tube. Below, the intestine is generally in a state of emptiness and contraction In some cases, several invaginations will be seen in different parts of the fecal tube—each one presenting to a greater or less degree the peculiarities just described. In the majority of cases, the invagination has been found at the arch of the colon, or at the termination of the small into the large intestines. The invagination, in the great majority of cases, will be observed to take place from below upwards, although the opposite occasionally obtains.

Treatment.—The leading indication in the treatment of ileus is to alleviate, and if possible overcome the spasmodic action of the muscular coat of the intestines, and thus prevent inflammation, relieve the intussusception, and open the bowels. At the very onset of the attack, we should endeavor, if possible, to ascertain the cause, and if hernia be detected, it should immediately be reduced. Cases of ileus have terminated fatally from a neglect of this precaution.

Believing the disease to be spasmodic in its nature, and prone to become inflammatory in its progress, we should keep our attention steadily directed to the pulse, remembering that in this case, as well as in all other diseases of the intestines, it very frequently betrays us into error. The least tendency to inflammatory action should be combated by the free use of the lancet. Keeping in mind the rapidity of the progress, and the extreme danger of this disease, we should, without hesitation or delay, abstract blood largely. This alone will in many instances have a decided effect in subduing spasm and preventing the occurrence of inflammation. Great advantage may also be derived from topical bleeding by means of cups or leeches applied to the abdomen. Blood-letting having been premised, we may have recourse to antispasmodics with the happiest effects. Of these, opium is decidedly the best. To obtain its most beneficial effects, the system should be put completely under its impression, by the administration of large and repeated doses. Under the influence of opium, spasm will be frequently allayed, the intussusception overcome, and the bowels evacuated. We may, at this period, with great prospects of success, interpose the use of purgatives. In the employment of these remedies, we should select such as are mild in their operation and gentle in their effects. Calomel will be found to possess a superiority over every other cathartic. Given in doses of ten grains, alone or with one or two grains of opium, it will frequently be retained on the stomach when everything else would be rejected. Castor oil in small and repeated doses, will frequently be retained, and may prove a useful adjunct.

Much reliance is to be placed in enemata. Acting directly upon the diseased intestine, they will often display effects highly salutary. A great variety of enemata have been recommended, all of which may, in particular instances, have had a beneficial influence. Copious injections of warm water will sometimes prove an important auxiliary, by relaxing the spasm, distending the bowels, and perhaps overcoming the constriction. Dr. Wiltbank related to me a case of ileus, in which the only remedy that had any influence in overcoming the disease, was a large enema of warm water administered by means of a stomach-tube introduced its whole length per anum. This remedy is worthy of further trial. That the administration of enemata by means of the stomach-tube may exert a powerful action in overcoming an intussusception, appears very reasonable. Cold water administered in a similar manner may also have a salutary effect. Tobacco is a remedy of pervading influence upon the abdominal viscera, and evinces such decided relaxing properties upon the muscular system gene-

rally, that the most happy effects may be anticipated from its employment.* Great caution is requisite in its use: beginning with a weak infusion, the strength may be gradually increased, until the system is under its full impression. Of the terebinthinate enema, I know nothing from experience; but from the adaptation of turpentine to many of the diseases of the bowels, I am inclined to think favorably of its powers, more particularly in the sinking stages of the disease.

These remedies failing, we should next have recourse to blisters. These are particularly efficacious in cases attended with inflammatory action. They should be sufficiently large to cover the whole abdomen.

Cold affusions to the abdomen and legs have long been a favorite remedy, and we are led to believe may, in some instances, have proved serviceable. Crude mercury has been used in intussusceptions from time immemorial, and is still a favorite practice in England. Abercrombie recommends it in this disease, in doses of one or two pounds. Whether it has ever proved beneficial, is extremely doubtful. John Hunter's practice in ileus, consisted in the administration of purgatives, when the enveloped gut was drawn upwards, and of emetics when it was drawn downwards. But the difficulty of this plan of treatment lies in the impossibility of determining, during the life of the patient, whether the constricted gut is drawn within the upper or lower portion of the intestine.

All our remedies will, however, frequently fail, and the system will sink under the combined effects of spasmodic and inflammatory action. In this case, stimulants are indispensable. In the administration of stimulants, it is desirable to select such as possess a purgative property. The tincture of rhubarb, and the wine or tincture of aloes, will be found to possess these qualities in an eminent degree.

Taking into consideration the difficulty experienced in affording relief, and the imminent danger attending an attack of ileus, surgeons have within a few years advised the Cæsarean operation. This operation, however, has been performed but in one instance. Dr. Fuschstius† relates a case, in which, after every remedy had proved unavailing, this operation was performed, the invaginated intestine drawn out, and a perfect cure obtained. Further trials of its efficacy in the relief of this disease will be required, before we should be justified in recommending it as a general remedy.

I have only to remark further, that we should resolutely persevere in the use of every remedy that our skill can devise, knowing that recovery is sometimes effected at a very late period, and when, to all appearance, no human effort could restore life.

Sect. VI.—*Constipation.*

Constipation is a term of relative import. For the due preservation of health and comfort, it may be laid down as a general rule, that a daily evacuation of the bowels is indispensably necessary. There are, however, exceptions to this rule. It is by no means rare to see individuals who have a natural stool but once or twice in a week; and cases have been reported, in which weeks, months, and, in one instance, seven years elapsed, without the appearance of a stool. These cases, however, are extraordinary, and should not affect the rule, that the bowels should be opened every day.

Constipation of the bowels is generally referable to sluggishness of the peristaltic action of the intestines, or to torpor of the liver. Good ascribes it, in some instances, to excessive action of the intestinal absorbents, by which the fluid portion of the feces is too rapidly removed, and they are left dry, scybalous, and difficult to be evacuated.

* [I have relieved several desperate cases of ileus by the tobacco injection, after the previous use of blood-letting, and of calomel and opium.—Mc]

† Hufeland's Journal der Heilkunde, Feb. 1826.

The symptoms attending constipation of the bowels are highly disagreeable. The breath is offensive; the mouth dry, and out of taste; the tongue furred, more particularly in the morning, and at its root; there are loss of appetite, nausea, headache, flatulence, and distension of the abdomen. The continuance of this affection is apt to induce indigestion, varices in the lower limbs, and piles.

Causes.—Costiveness may be produced by an astringent diet, want of fresh air, and active exercise, confinement to any particular posture of the body, neglect of the calls of nature, stricture of the bowels, and other organic disorders of the intestines and liver, and pressure of the uterus during pregnancy.

Constipation is often a constitutional disease, or it may become habitual from the nature and continuance of the causes producing it. The studious, the sedentary, the indolent, and all whose occupation confines them within doors, and especially those who are under the necessity of remaining long in any particular posture of the body, are peculiarly obnoxious to this affection. Females, from their want of active exercise in the open air, and during the period of pregnancy, from the pressure of the impregnated uterus upon the bowels, are particularly subject to constipation.

Treatment.—In attempting the relief of constipation of the bowels, it should be borne in mind, that simple and dietetic means will, in many instances, be sufficient to accomplish a complete cure. Ripe fruits, such as apples, peaches, pears, prunes, figs, gooseberries, strawberries, possess aperient properties, sufficient, in many instances, to overcome the most obstinate habitual constipation. Boiled vegetables are also proper articles of diet. The brown bread made of unbolted flour is a favorite remedy in this disease, and rarely fails in procuring regular and natural stools. All stimulating and astringent articles, such as cinnamon, nutmegs, &c., are injurious, and should be sedulously avoided. Meat should be eaten sparingly and under-done; beef, mutton, fowls, and the various kinds of game, are the most proper animal food.

Exercise is also an important remedy in this affection. It should be regular, active, and in the open air: walking, or riding on horseback will, in general, prove most salutary.

Above all, however, we should never lose sight of the necessity of a regular attempt at stool. This will frequently overcome attacks of this disease which have resisted every other means. An attempt at evacuations should be made daily at a certain hour, and although for a time we may be disappointed, yet perseverance will ultimately overcome the habit and relieve the disease.

Should the treatment recommended fail, or the urgency of the case admit of no delay, we must, without loss of time, administer purgatives. In the selection of these remedies, such should be preferred as operate mildly and effectually. The liver being usually implicated in this disease, the use of mercury in some form cannot be dispensed with. Commencing with calomel alone, or in combination with rhubarb, aloes, jalap, or some other active cathartic, it should be continued until the bowels are freely evacuated. The operation of the cathartics may be greatly aided by the administration of an enema. Injections are, indeed, an important remedy in this disease, and have, in this country and in England, been too much neglected. They should be simple, emollient, and frequently repeated.

The bowels having been evacuated, should be kept in a soluble state by the use of laxatives. The remedy I have found most effectual for this purpose is a combination of the blue pill, aloes, and tartarized antimony,* which may be repeated as often as occasion requires. Inspissated ox bile, in pills of five grains each, has been highly extolled, and may, perhaps, in some instances, have proved

* ℞.—Massa ex. hydrarg. ℈ij.
Pulv. aloes grs. xij.
Antim. tart. gr. i.—M. ft. Massa in pilul. No. xij. divid., one of which is the dose.

serviceable. Powdered charcoal has of late years been much used in this disease; care should be taken in its administration, as it, like magnesia, may form concretions in the bowels, and thus increase the disease it was intended to relieve. When it is employed, it should be in combination with some more active cathartic. Castor oil with a few drops of the oil of turpentine, will often display very happy effects. Good quotes two very obstinate cases of constipation, in which affusions of cold water over the legs and pubes produced an almost immediate evacuation of the bowels.

Should these remedies fail, and the habit become confirmed, the blue pill should be given every night for two or three weeks, and purged off on each succeeding morning by rhubarb. This will frequently succeed after everything else has failed. If it, however, prove inadequate to the relief of the disease, the mercury may be pushed to moderate ptyalism. This being accomplished, the disease will, in general, immediately give way, and a rapid cure be effected.

When the constipation is so great as to resist the operation of cathartics and purgative enemata, relief may, in general, be obtained by introducing a gum elastic tube (the stomach tube will answer) as high up the rectum as possible, without applying much force, and then throwing some purgative fluid, as infusion of senna, into the bowels. The quantity injected should be sufficiently large to cause considerable distension of the bowel.*

Sect. VII.—*Intestinal Worms.*

The origin of intestinal worms is enveloped in great obscurity. In whatever light this interesting subject is examined, insuperable difficulties present themselves to the mind. There are but two possible modes in which worms may be produced in the alimentary canal. They are either developed from *ovula* received into the stomach and bowels, from without, along with the food and drink —or they are formed in the intestines, independently of seminal matter, or ova generated by similar animals, by new chemical combinations, or what is technically called *spontaneous generation*. It does not comport with the design of this work to enter into a detail of the various arguments that have been advanced both for and against these views of the generation of intestinal worms; but it may be observed, that the supposition of their origin from ova received into the alimentary canal, necessarily presumes the existence of similar worms out of the body, by which these ova are generated. This, however, is not confirmed by accurate observation; for, although Linnæus, Gmelin, and a few others, assert that both *tæniæ* and *ascarides* have been found in stagnant waters and in marshes, the ablest helminthologists of the present day affirm that these worms differ very distinctly, both in structure and character, from those which are found in the intestines of animals. It must be observed, moreover, that earth worms of this kind are of exceedingly rare occurrence, and that they have been met with only in particular districts and localities—a circumstance which strongly discountenances the supposition, that they furnish the semina of intestinal worms, so common in man and in the inferior animals in every country and situation. The fact, too, that all intestinal worms almost immediately die when removed out of the body and exposed to the air, or placed in water, militates against the doctrine that they are the offspring of worms, whose natural habitation is out of the animal body; and finally, it has been satisfactorily ascertained, that earth worms and such as live in water, do not change their forms or character when accidentally received into the intestinal canal. Another circumstance directly opposed

* [The influence of galvanism has been relied upon in many cases by practitioners in this city. One pole of a light battery is introduced into the mouth, and the opposite pole is attached to a metallic bougie in the rectum. Galvanic beads made of alternate balls of zinc and copper, strung on a piece of whalebone, have also been introduced up the rectum. I have never observed, however, that any permanent advantage has been derived from such measures.—Mc.]

to the opinion that the seminal rudiments of intestinal worms are generated by worms out of the body, and conveyed, in some way or other, into the stomach and bowels of animals, is the fact that intestinal worms have been found in the bowels of new-born fœtuses. Kerkringius asserts, that he discovered lumbrici in the stomach of a seven-month fœtus; and in another instance he found a great number of small worms in the bowels of an infant soon after birth. Pallas states, that Brendel found a tape-worm in the bowels of a new-born fœtus; and Heim, according to the testimony of Bloch, met with a similar instance. Rudolphi mentions a case which occurred to the celebrated Blumenbach, in which tæniæ were found in the intestines of a recently born pup.*

If this view of the generation of intestinal worms be rejected, and to me it appears to be altogether untenable, we are obliged either to confess our total ignorance concerning this mysterious process, which would perhaps be the most prudent, or to resort to the doctrine of *spontaneous generation* to account for the origin of these parasitic animals. I cannot here enter into the arguments which may be adduced in support of this doctrine; but it appears to me that an erroneous sentiment of religion has here repressed the spirit of genuine philosophy—in other words, the prejudice, founded on a narrow view of the wise and mysterious scheme of Providence, has not permitted the majority of competent minds to view this interesting subject of research in its true light. The ancient dogma, *omnia ex ova*, may, I think, be rightfully questioned. When experience and sound reason lead us to a conclusion in philosophy, we may safely abide by it, although it may at first sight appear to run counter to the cherished sentiments drawn from the highest source of wisdom and goodness.

Of the causes that favor the production of intestinal worms.—However uncertain our notions may be, in relation to the origin of intestinal worms, observation has made us acquainted with the principal circumstances which favor their generation and increase. Among the remote causes that appear particularly to favor the production of intestinal worms, are,—a sedentary and inactive course of life; habitual exposure to a humid atmosphere; the abundant use of fat, and farinaceous articles of diet, and of fresh milk; the use of more food than the stomach can readily digest, or than is necessary to maintain the health and vigor of the system. Dr. Bremser asserts, that in general all articles of food which furnish a very abundant supply of nutrient elements, when habitually taken in larger portions than the ordinary wants of the system require, are particularly calculated to favor the generation of worms in the alimentary canal. Some writers have mentioned the free use of sugar among the causes particularly favorable to the production of intestinal worms—but this has been denied by others, whose opportunities of forming a correct judgment on this point were considerable. From the occasional epidemic prevalence of verminous diseases, it would seem that there are peculiar atmospheric constitutions, or aërial causes, which favor the generation of intestinal worms. The occurrence of epidemics of this kind has, indeed, been denied and even ridiculed by some; but if we are to place any reliance on the concurrent testimonies of some eminent writers, the fact of such epidemics having occurred must be admitted. Marie has given the history of a very remarkable instance of this kind, which occurred at Ravenna and the surrounding district. Bloch, too, has given an account of an epidemic worm-fever. That verminous affections are vastly more common in some countries or districts than in others, is unquestionable. It is said that in Savoy and Chambray intestinal worms in every class of society are remarkably common, (Daquin, Bremser,) and the same observation has been repeatedly made of Holland and Switzerland. Bremser thinks that the abundant use of milk and cheese in the latter country is probably the principal cause of the great prevalence of worm affections among its inhabitants. The occurrence of the tape-worm is particularly common both in Switzerland and in Holland; and it is especially remarka-

* Dr. Bremser—über lebende Würmer in lebenden Menschen, p. 16.

ble, that in the former country, the *bothriocephalus latus* (tænia lata) is by far the most common: whilst in Germany, the greater part of France, in Italy, and even in the Tyrol, the *tænia solium* (t. cucurbitina) is almost the only species of tape-worm met with. Rudolphi asserts, that in Sweden the *bothriocephalus latus* occurs very rarely, whilst the *tænia solium* is by no means uncommon.

Species of intestinal worms.—There are five distinct species of intestinal worms, viz:

1. The *tricocephalus dispar*—(*trichuris*—*tricocephalus hominis*—*ascaris trichuria.*) This worm, called by the English "*the long thread-worm*," is from an inch and a half to about two inches in length. About two-thirds of its length are almost as thin as a horse-hair, the remaining and posterior part being considerably thicker, terminating in a rounded or blunt extremity. The thin part is transversely striated; and the alimentary canal may be seen, by means of a lens, running from its thinner extremity in a direct line through the centre, into the thick posterior portion, where it assumes a flat and spiral form. These worms are seldom numerous, and are principally found in the cæcum.

2. *Ascaris vermicularis.*—(Oxyuris vermicularis—fusaria vermicularis—maw or thread-worm.) This is a very small white worm—the male being not above two lines in length, with a rounded or blunt extremity anteriorly, tapering to a point posteriorly. The female is considerably larger, being from four to five lines in length, terminating in an extremely fine extremity posteriorly, resembling the point of the finest needle. These worms are found only in the large intestines, and principally in the lower part of the rectum, where they are often collected in almost countless numbers.

3. *Ascaris lumbricoides.*—(Furaria lumbricoides—lumbricus teres.)—These worms are from two or three to ten or twelve inches in length, round, of a yellowish-white or brownish-red color, of nearly a uniform thickness, except at the extremities, which taper to a blunt point. They are from two to three lines in thickness. The head may be distinguished by a circular depression within a line of one of the extremities, terminating in three small tuberosities or valves, which the worm has the power of opening and closing. When they are opened, a very minute patulous projection may be seen, which constitutes the mouth of the worm. A very small groove passes longitudinally from one extremity to the other, on both sides. The alimentary canal terminates in a transverse depression on the under surface near the posterior extremity. The male is smaller than the female, and may be distinguished by its shortly curved caudal extremity. In some instances the organs of generation are conspicuous—consisting of two small cylindrical projections in the curved part of the tail. These worms inhabit the small intestines, and occasionally ascend into the stomach.

4. *Tænia lata.*—(Bothriocephalus latus—tænia membranacea—t. vulgaris.)—This worm often acquires a very great length—from thirty to forty feet and more. It is from four to ten lines in breadth, flat, white, and composed of a series of concatenated joints, resembling a piece of white tape. The head is armed with two processes, by which the worm attaches itself to the intestines. It inhabits the upper portion of the bowels and the stomach.

5. *Tænia solium.*—(Tænia cucurbitina.—t. osculis marginalibus.)—This worm is rarely if ever voided whole. It is passed off in pieces of a greater or less number of joints, or in single joints bearing a considerable resemblance to the seeds of *gourd*. Pieces, however, upwards of twenty feet in length, have been discharged, although generally not more than three or four joints pass off together. The anterior part tapers off into a very fine thread-like extremity, the head being extremely small, and furnished at its sides with four small apertures (*ascula*). This is the most common species of tape-worm, and like the tænia lata, inhabits the stomach and small intestines.

Symptoms.—The symptoms which usually arise from verminous irritation, and from the presence of which we may presume the existence of worms in the alimentary canal, are—countenance pale, lead-colored, with occasional transient

flushes; eyes dull; pupils dilated, with a bluish semicircle around the lower eyelids; tickling in the nose; tumid upper lip; occasional headache, and humming in the ears; copious secretion of saliva; tongue slimy or furred; breath foul; variable appetite—being sometimes voracious, at others wholly gone; transient pains in the stomach; occasional nausea and vomiting; pains in the abdomen, particularly about the umbilical region; frequent slimy stools, or costiveness; urine turbid, yellowish, or milky; abdomen tumid and hard, with emaciation of the other parts of the body; lassitude; irritability of temper. None of these symptoms, however, are certain indications of the existence of worms in the bowels—the only certain indication being the appearance of them in the evacuations from the bowels or stomach.

The opinion which has been expressed by some writers, that worms are harmless inmates of the intestinal canal, is most assuredly not founded on correct observation. Without doubt, many of the affections usually ascribed to worms, arise from other causes; and it is quite probable that that peculiar condition of the alimentary canal which favors the production of worms, may be, frequently, mainly concerned in giving rise to the various general affections which attend the presence of worms in the stomach and bowels. That verminous irritation is, however, sometimes the direct and exclusive exciting cause of severe and dangerous affections, is unquestionable. Chorea, epilepsy, hydrocephalus, emaciation, convulsions, mania, paralysis, fevers, dropsy, and a vast variety of anomalous disorders, are sometimes the immediate consequences of irritation from worms in the bowels, and occasionally speedily disappear after the expulsion of the worms. Esquirol states, that he has known eleven persons cured of mania, by the expulsion of a large number of lumbrici with anthelmintic remedies.

Treatment.—In prescribing for the removal or destruction of intestinal worms, it is of considerable consequence to confine the patient to a spare and liquid diet, and to exhibit two or three mild purgatives a few days previous to the exhibition of the proper anthelmintic remedies. With these preparatory measures, the ordinary vermifuge remedies will not disappoint us so often as without them.—My own plan of management for the expulsion of the long round worm (*lumbricoid,*) is to put the patient on a liquid diet, and to order him a small dose of Epsom salts every morning for three or four days. On the fourth morning I direct a decoction of the root of spigelia, in the proportion of an ounce of the root to a pint of water boiled down to half a pint. This being sweetened, is to be drunk in the course of three or four hours, by a child of from five to ten years old, commencing in the morning after having taken a little milk and water into the stomach. As soon as the whole of the decoction is taken, an active dose of calomel and jalap is to be administered, or a dose of castor oil and turpentine, in the proportion of half an ounce of the former to two drachms of the latter, given in doses corresponding to the age of the patient. I have rarely failed, by this plan, to procure the discharge of worms, where they existed in the bowels. A vast number of remedies and modes of treatment have been recommended for the expulsion of this species of intestinal worms. Bremser speaks very highly of the vermifuge powers of the following electuary.* A teaspoonful is to be given to a child every morning and evening for six or seven days. I have used this electuary in four or five cases with complete success. It should not be given to the extent of producing frequent and watery evacuations. I have found it to do most good when it procured three or four consistent stools daily. Rudolphi asserts, that the anthelmintic oil of Chabert (*oleum empyreumaticum Chaberti*) is decidedly the most efficacious vermifuge we possess, and both Bremser and

* ℞.—Sem. santon. sive tanacet. rudet. contus. ℥ss.
Pulv. rad. valerian ℥ii.
——— jalapæ ℥ss.—℈ii.
Sulphat. potassæ ℥iss—℥ii.
Oxymel. scillit. q. s. ut fiat electuar.—M.

Brera have added their testimony in favor of its usefulness in this respect.* Fifteen or twenty drops may be taken three or four times daily by children from two to seven years old. Small doses of calomel with the powdered roots of spigelia and valerian may also be resorted to with a prospect of advantage.—There is danger, however, of producing ptyalism from giving calomel in this way—more especially as it is generally necessary to continue its use for several days before its anthelmintic powers can be properly obtained. The most efficacious vermifuge remedies for the expulsion or destruction of the round worms, besides the articles already mentioned, are—chenopodium anthelminticum; sem. santonic.; tin filings; garlic; conferva helminthocordon; spirits of turpentine; Geoffræa Surinamensis; the green rind of unripe walnuts; and camphor.

To prevent the rapid reproduction of worms, after they have been expelled or destroyed by anthelmintics, recourse must be had to tonics—particularly chalybeates, in conjunction with minute portions of aloes, and a plain and abstemious diet. A strong decoction of the helminthocordon has appeared to me not only very valuable as an anthelmintic, but particularly also to remove that debilitated and disordered state of the alimentary canal, which favors the production of worms. An ounce of this marine vegetable, with a drachm of valerian, should be boiled in a pint of water, down to one gill. Of this, a teaspoonful may be given every morning, noon and evening, with peculiar advantage, to children laboring under verminous affections. I have, in several instances, known the use of this decoction to restore perfect health to children who were supposed to labor under verminous irritation, without any appearance of worms in the evacuations. It has appeared to me particularly beneficial in cases attended with the usual symptoms of worms, connected with want of appetite and mucous diarrhœa, arising from mere debility of the digestive organs, and vitiated secretions in the bowels.

Ascarides.—These little worms are generally extremely annoying. During the day they seldom give rise to much inconvenience; but in the evening, and particularly soon after lying down, they usually occasion a very distressing, and indeed, an almost insupportable itching and titillation in the lower part of the rectum and the anus. So extremely distressing is the sensation which they cause in these parts, that nervous children are sometimes thrown into convulsions by it. In females, these worms sometimes pass into the vagina, and give rise to very great uneasiness. Dr. Bremser states, that he has known an instance in which symptoms of nymphomania were excited by the irritation of ascarides, which had made their way into the vagina. They are generally most troublesome during damp weather.

The removal of ascarides is often attended with great difficulty, for although the inconveniences which they create may be removed for a time, they almost always recur again and again, in those who are once infested with these worms. From the location of these worms, in the lower part of the rectum, little or no advantage can be obtained from the use of anthelmintics administered by the mouth; and even active purgatives seldom evacuate them sufficiently. Aloes, however, from its decided tendency to act on the lower portion of the bowels, will occasionally expel them in great quantities, particularly when assisted with proper enemata. My usual mode of proceeding for the expulsion of these troublesome worms, is to prescribe three or four aloetic purgatives every second day, together with two or three enemata composed of a mixture of lime-water and milk, in equal proportions daily. Injections of a solution of aloes, or of infusions of any of the above-named vegetable anthelmintics, will generally bring off an abundance of these annoying little worms. I have, in a few instances, brought them away in great quantities, by injections composed of spirits of turpentine

* This oil is made by mixing one part of the fetid spirits of hartshorn with three parts of the spirits of turpentine, and suffering them to digest for four days. The mixture is then to be put into a glass retort, and distilled in a sand-bath until three-fourths of the whole have passed over into the receiver. This is to be kept for use in small and well-closed vials.

mixed with milk, in the proportion of a teaspoonful of the former to a gill of the latter. The introduction into the rectum of a bougie smeared over with mercurial ointment, has been employed with success for the destruction of ascarides; and Nil Rosen speaks very favorably of injections composed of a drachm of refined sugar dissolved in warm milk. When ascarides have passed into the vagina, injections of cold water with a small portion of vinegar, are, according to the experience of Dr. Bremser, the best remedy we possess. Dr. Van Vest asserts, that flowers of sulphur, taken in the morning on an empty stomach, are one of the most efficacious remedies for the destruction and expulsion of these worms.

Tape-worm.—For the expulsion of the tape-worm, a very great variety of remedies and modes of treatment have been recommended. The anthelmintics that have been found most effectual against this species of intestinal worms, are —polypodium felix; spirits of turpentine; tin; valerian; the bark of the pomegranate root; and the empyreumatic oil of Chabert. Whatever mode of treatment be adopted, it is always of much consequence to prepare the patient by proper diet and laxatives before the proper vermifuges are given. A spare and liquid diet, with the daily use of small doses of saline purgatives for four or five days, will greatly increase the chances of procuring the expulsion of the worm, by the use of anthelmintic or active cathartic remedies. The following is the substance of some of the most celebrated methods of treatment recommended for the removal or destruction of tænia.

Alston's method.—On the first day the patient is actively purged with an infusion of senna and manna. On the following morning an ounce of pure tin filings, mixed with common syrup, is to be taken (by an adult): and on the second and third mornings respectively half an ounce of tin filings is administered, which is followed on the fourth morning, by an active dose of senna and manna. Pallas speaks in very favorable terms of this mode of management, and assures us that he has several times succeeded completely in effecting the expulsion of tænia with it. Bremser also has employed it with success in a few cases.

Desault's method consists in the employment of mercurial frictions on the abdomen, followed by drastic mercurial purges.

Herrenschwand's method.—A drachm of the powdered *male fern root* is to be taken morning and evening on an empty stomach, for two days in succession. On the morning of the third day the following purgative must be taken.* Three hours after this dose is swallowed, the patient must take an ounce of castor oil, and this dose must be repeated in an hour; if in three hours, after the second dose of oil, the worm has not been expelled, a third dose of it is to be taken; and should all these fail in procuring the expulsion of the worm, an injection of three ounces of castor oil in warm milk and water, should be administered in the evening.

Hufeland's method.—A cup of a decoction of garlic in milk is to be taken every morning on an empty stomach; and a tablespoonful of castor oil every morning, noon, and evening, with half an ounce of tin filings daily, and frictions on the abdomen, with petroleum twice every day. The patient is to eat salted food. This method must be pursued for several weeks, or until the head of the worm is expelled.

Nouffer's method.—This mode of treatment was at one time in high esteem; and many very respectable names might be mentioned in testimony of its occasional efficacy for the expulsion of the tape-worm. In the evening the patient must take a bowl of panada for his supper; fifteen minutes afterwards a glass of light wine with a biscuit; and if the bowels were not moved during the day, an enema composed of an infusion of mallows and a little common salt, with a few ounces of sweet oil, is to be administered. Early on the following morning,

* ℞.—P. gambogiæ grs. xii.
Subcarbonat. potassæ grs. xxx.
Sapo Venet. grs. ii.
Misce.—To be taken at one dose

eight or nine hours after the panada was taken on the preceding evening, the following powder is to be administered, while the patient is yet in bed.* Should this be rejected by the stomach, a second dose must be taken. Two hours after this powder is swallowed, the following purgative bolus must be administered;† after which the patient should drink a few cups of green tea, and walk about in his chamber. As soon as the purge begins to operate, a cup of weak tea must be drank at short intervals, until the worm passes off. When this occurs, and not sooner, he may take a moderate portion of animal broth. If this course of management do not succeed in bringing off the whole of the worm, it should be repeated in the same manner as has just been described. This method will frequently succeed in expelling the *tænia bothriocephalus;* but it does not appear that it is capable of effecting the expulsion of the *t. solium.* M. Odier recommends the use of three ounces of castor oil instead of the above purgative bolus: and it would appear from the observations of other writers, that this modification of Madame Nouffer's plan is advantageous.

M. Rathier speaks highly of the following composition as a remedy for the expulsion of tape-worm.‡

Schmucker's method, which has been highly praised, consists in the employment of the seeds of sabadilla. The pods with the seeds are to be finely powdered; out of which boluses are to be made containing five grains of the powder. Having purged the patient well with rhubarb or Glauber's salts, on the following morning, half a drachm of the sabadilla powder, rubbed up with an equal quantity of sugar, is to be taken. This generally causes vomiting. In an hour after this powder is taken, some barley-water or oat-meal gruel should be swallowed. On the next morning another dose of the sabadilla powder must be administered, which will again excite vomiting. If no worms are discharged after this dose, the patient must take but fifteen grains of the powder on the following morning, but the same dose should be repeated in the evening; and the same doses are to be taken on the fourth day. On the fifth day, a purge, composed of thirty grains of powdered rhubarb with eight grains of rosin must be taken. On the morning of the sixth day, three of the above-named boluses must be swallowed, and the same number on going to bed. In this way the treatment must be continued for twelve, fifteen, or even twenty days; and Schmucker asserts, that when properly persevered in, it will seldom fail to effect the expulsion of the worm.

Bremser's method.—Mr. Bremser assures us, that, by the following method of treatment, he has succeeded in more than five hundred instances, in procuring the expulsion of the tænia solium. The cure is commenced by taking three times daily a teaspoonful of the electuary already mentioned for the expulsion of the round worm. (Sem. cinæ; rad. valerian.; p. jalap; and tart. vitriol.) When the whole of the portion ordered in the formula is thus used, two teaspoonfuls of Chabert's anthelmintic oil must be taken every morning and evening in a little water. If it occasions vertigo, as is sometimes the case, the dose should be diminished. After the patient has taken this oil about ten or twelve days, he must take a purgative;§ after which the use of the oil must be continued. In general it requires from four to five ounces of this oil before the cure is effected.

* ℞.—P. rad. filicis mas ℥ii–℥iii.—To be taken in six ounces of common water.

† ℞.—Submuriat hydrarg.
P. scammon., ää grs. x.
G. gambogiæ grs. vi.–vii.—M. ft. bolus.

‡ ℞.—Pulv. herb. saben. grs. xx.
Pulv. sem. ruth. grs. xv.
Submuriat. hydrarg. grs. x.
Ol. destil. tanacet. grs. xi.
Syrup. folior. persicor. q. s.
Ft mass. ex. quo. form. bol. no. ii.—One of these boluses is to be taken in the morning and the other in the evening.

§ ℞.—Rad. jalap. ℈i.
P. fol. sennæ ℥ss.
P. sulph. potassæ ʒi.—M. Divide into three equal parts. Take one every hour.

The *spirits of turpentine* has of late years been highly recommended as a remedy for the expulsion of tape-worm. From two to three ounces of this article may be given at once, and followed in about two hours by a strong dose of castor oil. From the accounts which have been published, of the employment of this article as a vermifuge for tænia, there can be no doubt that it is well deserving of attention as a remedy for this purpose. I have known it to be used with complete success in one instance. In a late number of *Hufeland's Journal*, the following formula is highly recommended as a remedy against tape-worm:—

℞.—Tereb. venet. ℥i.
Sapon. jalapin. ℥ss.
Extract. hyoscyam. grs. iv.
Calomel grs. viii.—M. Divid. in pil. pond. grs. ii. Take four every three hours—the patient taking nothing but very thin broth for his food.

If the worm is not expelled the first day, the use of the pills must be continued for three or four days. Dr. Wilde used this remedy with success in two cases; and an instance was successfully treated with it in the Polyclinic Institute of Berlin.*

The *extract of the male fern* has lately been employed for the cure of tænia with marked success. Dr. J. I. Ebers has given an account of eight cases, in which this extract was used with the happiest effects. He gave from eighteen to twenty-four grains of the extract divided into two doses. In general this quantity has been sufficient to cure the patient. In some instances, however, it was necessary to repeat the dose three or four times. On the day after the extract was taken he administered an active cathartic, which generally brought away the worm. From his experience with this remedy, Dr. Ebers draws the following conclusions: 1. The extract of male fern root is one of the most certain means that can be employed against the tape-worm; 2. It generally kills the worm speedily; 3. It acts as a specific; 4. It does not expel the worm in a ball or mass as other anthelmintics usually do; 5. This medicine acts, usually, in a mild manner, and without producing any severe symptom: once only it produced some severe effects in a female, who had not the tape-worm; 6. It also expels *ascarides*, but does not kill them.†

The root of the pomegranate also is a valuable remedy for the expulsion of the tape-worm. Dr. Ruggia, a physician of Naples, has employed it with great success; and Dr. Mile informs us that in his hands it has proved very effectual. I am informed by Dr. Mease, of this city, that he has used it in one instance with entire success; and he has heard of other instances in which it effected a cure, in this country. It is somewhat singular that this valuable remedy should so long have been neglected by the profession; for it is only within a few years past that we have heard anything concerning its active anthelmintic powers, although, among the ancients, it appears to have been a favorite and common remedy for this purpose. Celsus prescribed it for the expulsion of tænia;‡ and it is strongly recommended by Ætius, as a most efficacious remedy for this purpose.§

Two ounces of the fresh root are to be sliced finely, and slowly simmered in a pint of water down to half a pint. Of this decoction, one-third must be

* Hufeland's Journal. June 1826.

† Amer. Journ. Med Sciences, vol. v. p. 214, quoted from the *Journ. de Chimie Médicale.*

‡ Si lati sunt, aqua potui dari debet; in qua lupinum, aut cortex mori decoctus sit: aut cui adjectum sit contritum vel hyssopum vel piperis acetabulum, scammoniæ paulum. Vel etiam pridie, cum multum alium ederit, vomat. *Posteroque die mali punici tenues radiculas colligat, quantum manu comprehendet, easque contusas in aquas tribus sextariis de coquet, donec tertia pars superset; huic adjiciat nitri paulum et jejunus bibat.* Interpositis deinde tribus horis duas potiones sumat talis aquæ vel muriæ duræ huic adjectæ; tum desideat, subjecta calida aqua in pelve.—Celsus, *De re Med.*, lib. iv. cap. xvii.—I doubt whether any treatment proposed by modern physicians, is better calculated to effect the expulsion of tænia than the one here recommended by Celsus

§ Tetral. iii., serm. i. c. 39, 40.

taken early in the morning on an empty stomach, and another third every two hours. If this does not expel the worm, the same is to be repeated next day, and so on. The diet should be liquid, and an active purgative given after the third portion is taken.*

Sect. VIII.—*Hemorrhoids—Piles.*

Hemorrhoids having, of late years, been considered as more especially belonging to the province of the surgeon, we need not wonder that they are now much too exclusively regarded as mere painful tumors of a local character, the cure of which should never be delayed. Dr. Gregory observes that the hemorrhoidal flux was formerly "believed to be a salutary provision of nature for the advantage of the constitution. The sudden suppression of it, therefore, was highly dreaded. These notions have passed away, and piles are now regarded as a painful and disagreeable complaint, arising, in most cases, from local causes, the cure of which should never be delayed." Upon this point, however, we may reasonably demur; for, without regarding this affection as "a special effort of the vis medicatrix naturæ," observation and experience have, I think, amply demonstrated the fact that these tumors, and the consequent effusion of blood, are, in *many* cases, the consequence of plethora of the portal vessels generally, attended with a particular sanguineous determination to the vessels of the lower portion of the rectum, arising, perhaps, generally from constitutional causes analogous to the sanguineous afflux to the uterus during the menstrual periods in females. The premonitory symptoms which usually precede the appearance of the hemorrhoidal flux—the *molimina hemorrhoidalia*—generally indicate a preternatural afflux to, and congestion in, the vessels of the lower part of the abdomen; and, I apprehend, the precept that the suppression of this hemorrhage should "*never* be delayed," would, if it were generally followed, afford no very gratifying illustration of the supposed advancement of our science in relation to this subject. Without doubt, hemorrhoidal tumors are sometimes the result, also, of mere local causes, and may be safely removed as soon as possible. But whether the original cause be local or general, we may well doubt the propriety of suppressing the discharge after it has become habitual.

A deranged state of the circulation and plethora of the abdominal viscera, and especially of the lower portion of the intestinal canal, is never absent in this affection, unless the piles arise wholly from local causes, and consist rather of an indurated or thickened state of the mucous membrane than of vascular or varicose tumors. The veins of the rectum, in consequence of this state of the portal circulation, become dilated or varicose, or the blood is effused into the cellular membrane beneath the mucous membrane of the rectum, forming sanguineous tumors. "In consequence," says Montégre, "of various causes which are sometimes beyond our cognizance, sanguineous determinations occur, at certain periods, towards the lower part of the rectum. This, at first, gives rise only to a feeling of tension and weight in the pelvis and extremity of the rectum—which, as it is not attended with actual pain, is often scarcely noticed, and usually subsides in three or four days. After a longer or shorter lapse of time, these symptoms are renewed, which generally terminate in a discharge of florid blood, spread over but not mingled with the feces. This blood issues by a kind of exhalation from

* [I once caused the expulsion of an entire tape-worm from a young lady, by active purging with croton oil. During my attendance on the Philadelphia Alms House Hospital, I allowed a veteran sufferer from the same evil, to cure himself by permitting him to subsist for three days upon brandy and spirits of turpentine. His name was George Williams, and he had been afflicted with the disease in its worst form for several years. He swallowed the turpentine in half pint draughts at a time, and brandy in still larger quantities, both of which he repeated several times without exciting either strangury or intoxication. At the end of three days he expelled many yards of a large tænia, and was effectually cured. He remained well, under my occasional observation, for many years.—Mc.]

the mucous membrane of the rectum, without any lesion or erosion of this tissue whatever. After these fluxionary movements have returned more or less frequently—sometimes after a few repetitions—tumors of a greater or less size, and more or less painful, begin to make their appearance."*

As has already been intimated, there are two kinds of hemorrhoidal tumors, viz: the vascular or varicose swellings just mentioned; and those firm, spongy tumors, more commonly called piles, which arise from a thickened and condensed state of submucous cellular tissue. These two forms of the disease may be readily distinguished from each other by the following characteristic circumstances. The former or varicose tumors are of a dark and bluish color, soft and elastic to the touch, broader at the base than at the apex, rounded or somewhat hemispherical, and considerably lessened by gradual pressure with the fingers, though quickly returning to their usual size when the pressure is removed. They generally occur in regular clusters, and often extend high up along the rectum.

The other variety of hemorrhoidal tumors appears like small fleshy tubercles of a pale-red or brownish color, situated a short distance above the margin of the anus, or descending like pendulous excrescences from the rectum. They have a somewhat firm and spongy feel, "and when cut into, present a more or less compact surface, from which the blood oozes, leaving the texture pale and relaxed." When they are situated externally, they are paler and more elastic and transparent. These tumors frequently contain a small cavity in the centre, containing fluid or coagulated blood. More commonly, however, no such cavity exists, the whole substance of the tumor being infiltrated with blood, becoming at last coagulated and dark.†

"The manner in which these hemorrhoidal excrescences are formed, is in general pretty uniform. The patient is at first made sensible of its development by a peculiar pricking, stinging sensation, generally within or around the margin of the anus, and on applying the finger to the part it is felt slightly elevated, as if some newly-formed substance were forcing its way to the surface. The increase of these tumors, when once they become permanent, does not take place in every direction; they elongate rather than expand, the body being usually of a *conical shape, and larger than the neck.* Sometimes more or less blood is exhaled from their surface; on other occasions a serous fluid only is exhaled, or they remain nearly dry; but in either case they generally disappear in a short time, and return again at an uncertain or irregular period, increasing in size, and becoming firmer in texture with each repetition." (Calvert.)

General symptoms and consequences of hemorrhoids.—The approach of an attack of hemorrhoids is frequently announced by various symptoms denoting a deranged state of the circulation. In most instances the patient experiences, for several days before any manifestations of the local hemorrhoidal affection occur, a sense of weight and pressure in the abdomen, with a peculiar feeling of uneasiness in the bowels, constipation, and a sensation of bearing down in the rectum or perineum, attended, frequently, with horripilation in the back and loins,‡ slight flatulent pains in the stomach and colon, scanty and high colored urine, pale countenance, an occasional confused sensation in the head, general lassitude and heaviness of the extremities, an irritable and discontented state of the mind, a hard and contracted pulse, and a sense of anxiety and fullness in the epigastrium. In many cases an unusual desire for venereal enjoyment, with strong erections, and even nocturnal pollutions take place;§ and the patient often experiences a troublesome itching in the glans penis, and occasionally slight swellings and tenderness of the prepuce and testicles, attended sometimes with a blennorrhœal discharge from the urethra.‖

* Dictionnaire des Sciences Médicales, art. Hemorrhois.
† Practical Treatise on Hemorrhoids, &c., by George Calvert, p. 35.
‡ Pinel, Nosograph. Philos., vol. ii.
§ Lentin, Bertræg. zur Ausuebent Arzneiwiss, vol. ii. p. 365.
‖ Richter, Specielle Thérapie, bd. iii. p. 350.

These symptoms are not, in general, continuous. They are apt to remit, or to disappear entirely for a short time, and then return again, especially on committing errors in diet, taking stimulating drinks, or making unusual corporeal or mental exertions. They generally continue, in a greater or less degree, until the tumors either burst and relieve the engorged vessels, by a free discharge of blood, or until they begin to decline and disappear. In some cases, however, these *molimina hemorrhoidalia*, after having continued for some time, disappear again, without the occurrence of the local hemorrhoidal affection.

The *local affections* which attend hemorrhoidal tumors, are sometimes extremely severe and distressing. In some instances the elongated fleshy tumors, at last, become inflamed and give rise to severe pain—particularly during the expulsion of feces. When they are situated high up, they are often forced down past the sphincter, and from the irritable condition of the parts, and the enlarged and exquisitely tender state of the tumors, they cannot be again returned. In this situation they give rise to continued and extreme suffering, and the inflammation occasionally runs so high as to cause suppuration and sloughing.

When the inflammation extends to the surrounding mucous membrane, it gives rise to a blennorrhœal discharge from the tumors and lower portion of the rectum—consisting of a thin, acrid, and mucous secretion, which soils the patient's linen, and causes tenderness and excoriation about the anus. Sometimes the tumors break, leaving *fissures*, which, from the irritation caused by the motion of the parts, and the passage of indurated feces, as well as the acrid secretions, are converted into very painful irritable ulcers. Montégre has classed the pains which attend hemorrhoids under four heads. 1. Those which arise from active inflammation, characterized by heat, tension and throbbing in the part, varying from a moderate degree of these sensations to the most excruciating sufferings. 2. *Nervous pains*, characterized by the intermissions and the very sudden increase and diminution to which they are subject, as well as the considerable relief which is generally obtained by pressure. These pains do not appear to depend either on fissure or strangulation of the tumor, and often take place without any evident inflammation. They sometimes supervene after the inflammation has subsided, and may continue, with variations of intensity, for several months, and occasionally much longer. (Montégre.)

The pain which usually attends fissures, or rhagades of the tumors or edge of the anus, are distinguished by the following circumstances. On going to stool the patient experiences a slight stinging pain in a certain part of the rectum or anus. After the feces are expelled, the pain increases more or less rapidly until it becomes excruciatingly severe—in which state it usually continues until "exhausted, the patient falls into a sound sleep, from which he awakes free from suffering." No further pains are experienced until the patient again goes to stool, when they are renewed in the same way as before.

Contraction of the anus is no uncommon consequence of habitual hemorrhoids, and may arise—1. *From a number of tumors formed around the internal surface of the rectum*, a short distance above the anus, which, when pressed down on going to stool, approximate each other, and diminish the passage so as to create more or less difficulty in voiding the feces—more especially when they are hard. 2. *From induration of the cellular tissue* near the extremity of the rectum, giving rise to a progressive decrease of the size of the passage, being in general unaccompanied with pain, except when the patient goes to stool, and the feces are hard. 3 *From spasmodic constriction of the anus.*—This appears to occur almost exclusively in persons of a nervous and irritable temperament. When the patient goes to stool, the sphincter of the anus being irritated by the feces, contracts spasmodically, and with such force, that extreme difficulty and pain occur in voiding the contents of the rectum, and any attempt to introduce the finger, with the view of examining into the state of the affected parts, is attended with the same difficulty and severity of pain. It is often wholly uncon-

nected with inflammation of fissure. Sometimes *ulcers*, *abscesses*, and *fistulæ* are formed near the extremity of the rectum, terminating occasionally in fistula ani.

Among the most common consequences of this affection is a kind of tenesmus, with protrusion of the inner tunic of the rectum, so as to form a prominent and extremely sensitive ring around the anus—particularly after each attempt to expel the feces. The tenesmus seems, in part, to be caused by the afflux of blood to the affected parts, and also by the impressions of the feces upon the irritable mucous membrane of the lower part of the rectum, by which a frequent desire to stool is created, which being repeatedly assisted by ineffectual efforts to evacuate the feces, gives rise to permanent induration, scirrhus, and even cancer of the rectum. (Montégre.)

Causes.—The causes of hemorrhoids may be classed under two heads,—namely, *general* and *local*. Among the general causes some are evidently simply *predisposing;* whilst others are more immediately concerned in exciting the hemorrhoidal affection. There appears to be a peculiar physical temperament or abnormal condition of the body, which predisposes in an especial manner to the occurrence of this affection; and it would seem that this hemorrhoidal constitution is often manifestly hereditary. Richter supposes that this predisposition consists principally in an original inactivity of the circulation in the abdominal viscera, in consequence of which habitual congestion of the portal vessels is established. Be this as it may, it appears very evident that persons of a sanguino-bilious, or as it has also been termed, sanguino-melancholic habit of body, are most prone to hemorrhoidal affections. Of the very great influence of *age* in favoring the occurrence of this disease, there can be no doubt. Hemorrhoids before the age of twenty-one years, is far from being common, and when the disease does occur at or before this period of life, it is almost always the consequence of local causes, or of other diseases giving rise to congestion in the portal vessels. From thirty to fifty years of age is the period to which the appearance of these tumors is in a great measure confined. Those who remain free from the disease until they attain the age of fifty, seldom afterwards become more than very temporarily affected by it. Although pregnancy, and the final cessation of the menses, are well calculated to favor the occurrence of sanguineous congestion in the vessels of the abdominal viscera, and particularly of the rectum, yet, with the exception of the periods when these conditions are present, hemorrhoidal affections appear to be much more common in males than in females.*

The influence of age in favoring the occurrence of this malady, may be accounted for from the natural tendency of the venous to predominate over the arterial system, as individuals advance in age—and especially, from the equally manifest tendency in middle and advanced age to a sluggish state of the circulation in, or perhaps an increased sanguineous determination to the abdominal viscera, in consequence, probably, of a natural disposition, aided by the many causes which, as life advances, intervene, and tend to the same effect—such as the depressing passions, a more inactive course of life, debility of the digestive organs, and consequent torpor of the liver and bowels. I have stated that the predisposition to hemorrhoids appears sometimes to be hereditary; but it is probably, also, in many instances, acquired during infancy from improper dietetic management, and the habitual use of purgative medicines, so common, and in its ultimate tendency, so injurious a practice with nurses and mothers.

Habits of life tending to determine the blood to the abdominal viscera, or to cause congestion in the portal vessels, are by far the most common source of hemorrhoidal affections. A studious and sedentary habit; a superabundance of high-seasoned and stimulating food; the depressing passions; the intemperate use of spirituous drinks; and the very free use of strong coffee,† are among the most active general causes of this affection. It is probable that these causes operate towards the production of hemorrhoids chiefly by producing weakness

* Jahn. Klinik. der Chron. Krank., bd. iii. 453.

† Richter, Jahn, loc. cit.

of the digestive organs, as well as torpor of the liver and intestinal canal—giving rise to habitual costiveness, and consequently to a sluggish and congested state of the portal circulation. When to these conditions is added the local irritation of the rectum and anus caused by the remora and passage of hardened feces, it is obvious that hemorrhoidal tumors must be especially apt to occur. Among the local causes of hemorrhoids, besides constipation, we may mention the abuse of active purgatives—particularly aloetic preparations; stimulating enemata; frequent excitation of the venereal organs; pregnancy; parturition; suppositories; clothes worn so tight as to compress the abdomen; ascarides; irritating applications to the anus after going to stool; indurations of the liver or spleen; riding on a hard trotting horse; dysentery; the irritation of calculus in the bladder; enlargement of the prostate gland; lifting and carrying heavy burdens.

Hemorrhoids have been divided into a great number of species; but although these classifications may be convenient for imparting a full view of the subject to learners, they do not appear to possess any particular practical value. It is sufficient to bear in mind, that there are two kinds of hemorrhoidal tumors—one consisting in a dilated or varicose state of the veins, which may inflame, burst, and give exit to copious discharges of blood; and another kind, more common—consisting in firmer, fleshy, somewhat spongy elongated tumors or excrescences—which may inflame, open into fissures, ulcerate or remain entire, and give rise to the various painful and distressing affections already described. When the former tumors burst and bleed, they are called *hemorrhoides fluentes*, or *bleeding piles;* when the tumors do not bleed, they are termed *h. cæcæ*, or *blind piles*.

Treatment.—May we, with safety, attempt to remove or suppress these tumors; and more especially, is it prudent speedily to suppress the sanguineous discharges to which they give rise? Upon this subject very discrepant opinions have been expressed. Cullen was of opinion that the disease is but very rarely of a constitutional character; and, consequently, that it ought, in all cases, to be removed as speedily as possible; as no danger, he presumed, need be apprehended from the immediate suppression of the hemorrhoidal discharge. Dr. Gregory appears to be of the same opinion. This view of the subject, however, would inevitably lead to very disastrous consequences were it generally adopted in practice: for, although hemorrhoids are, in many cases, of a purely local character, and in such instances may be removed as soon as convenient, without any detriment to the system, yet both experience and analogy present us with abundant testimony of the dangerous consequences which are liable to result from a hasty interference with the hemorrhoidal discharge, where the disease is founded, as it very often is, on a constitutional predisposition.* In cases that depend on a constitutional hemorrhoidal tendency, and *that have become habitual* from long continuance or frequent recurrence; or where the general health or some chronic affection has been improved by the supervention of hemorrhoidal discharge; and especially where the disease is preceded and accompanied in its progress by distinct manifestations of an hemorrhoidal effort in the system, very particular caution should be exercised in the application of remedies calculated to suppress the disease.

Nevertheless, where the discharge is excessive, and endangers the life of the patient by the great depletion it causes, we need not hesitate to interfere with the progress of the disease, so far, at least, as to moderate the hemorrhage, and obviate the immediate and remote dangerous consequences from this source. The general indications to be kept in view in the remedial management of this affection are—to remove and counteract the tendency to plethora in the portal

* [During the last 15 years, I have been in the habit of extirpating all troublesome hemorrhoidal tumors, either by the knife or ligature, without any such troublesome consequences. Even after long-protracted hemorrhages which have resulted in complete *anemias*, I have succeeded in restoring excellent health by my operations. I may quote the high authority of Dr. Chapman upon this point, who invariably recommends extirpation of the tumors, in all vexatious cases.—Mc.]

circulation; to obviate the predisposing and occasional causes; to moderate the hemorrhage where excessive; and to prevent and remove local inflammation and its consequences.

During what may be called the latent stage of the disease, when the various premonitory symptoms enumerated above, the *molimina hemorrhoidalia*, exist, a general treatment calculated to remove the plethora of the portal vessels, as well as all irritation and preternatural determination to the vessels of the rectum, should be pursued, with the view of obviating or moderating the approaching hemorrhoidal attack. For this purpose, the patient should be put on a light vegetable diet; and if the pulse be full and active, blood should be freely drawn. Particular attention, too, must be paid to the state of the bowels. If they cannot be kept in a soluble state by vegetable diet, some of the milder laxatives, particularly the flowers of sulphur and cream of tartar,* with an occasional dose of blue mass in the evening, should be given once or twice every day, in doses sufficient to keep the bowels loose, without producing actual purging. The patient must lie on a matress, rise early, take gentle exercise by walking, avoid severe mental or very active corporeal exertions, abstain from stimulating drinks, as well as from condiments, and according to the observations of Jahn and Richter, from the use of strong coffee.

Treatment of the hemorrhoidal discharge.—When the tumors burst and pour out blood, the patient almost always soon feels considerably relieved. The confusion and uneasiness in the head, the irritability and depression of the mind, as well as the general lassitude, tension, and aching in the loins, pressure and weight in the perineum, and in general all those symptoms which have been mentioned as indicative of the hemorrhoidal effort, abate very materially, and in many instances almost entirely disappear. So long as the hemorrhage remains moderate, it may with propriety be regarded as a salutary discharge, in reference to the radical affection, or state of the circulation in the portal vessels. It should always be recollected, that the *discharge of blood* is only one of the ultimate consequences of hemorrhoids; and that as its direct tendency is to lessen the engorgement of the vessels of the rectum, and consequently to reduce the vascular hemorrhoidal tumors, it is obviously most proper to leave the hemorrhage to itself, unless it becomes very profuse, or inordinately protracted. We cannot, however, decide from the mere copiousness of the discharge, whether it should be regarded and treated as a morbid excess or otherwise; for some individuals will bear very large evacuations in this way, whilst others will be much debilitated and exhausted by a smaller loss of blood. Whenever the pulse becomes weak, the countenance pale, and the prolabia exsanguious, with much debility, general relaxation, and spasmodic symptoms, means should be adopted to restrain or arrest the evacuation. Here it must be recollected, that this, as well as other varieties of hemorrhage, may be connected with a manifest phlogistic diathesis of the general system on the one hand, or a relaxed, prostrated, and sluggish state of the general and abdominal circulation; in other words, that there is an *active* and a *passive* state of the hemorrhoidal discharge. In the phlogistic or active form, the patient must be kept cool and quiet, in the horizontal position; his drink must be bland, cool, and acidulated; and nitre dissolved in a mucilaginous fluid, should be ex-

* ℞.—Flor. sulph. crem. tart., āā ʒss—M. Take a teaspoonful twice or thrice daily.

When the intestinal canal is in a debilitated and very torpid condition, Richter recommends the following composition:

℞.—Tartar depurat.
Magnes. carbon.
Flor sulph., āā ʒii.
P. camphoræ grs. viii.
Pulv. sem. fœnicul. ʒiii.—M. Divide into 14 equal parts. Take one every three hours.

Hildebrandt speaks very highly of a mixture of sulph. sodæ and tincture of rhubarb, as a laxative in such cases. Two drachms of the salt, dissolved in two drachms of water, to which the same quantity of the aqueous tincture of rhubarb is to be added. One half to be taken in the morning, and the other in the evening.

hibited internally.* If these measures do not adequately moderate the discharge, recourse may be had to dry cupping over the loins or hypochondriac region; or to sinapisms and blisters to the inner part of the thighs, or over the hypochondriac region; and in very obstinate cases we must have recourse to injections of cold water or water in which a small portion of the acetate of lead or alum is dissolved; and occasionally it may become necessary to introduce a tampon into the rectum. Considerable benefit may sometimes be derived from the internal administration of one or two grains of the acetate of lead in such cases. It very rarely occurs, however, that any particular difficulty is experienced in arresting the discharge where the general habit is not particularly relaxed. The most obstinate and protracted cases of hemorrhoidal discharge are those which are termed *passive*, in which the general system is sluggish, the countenance pale, and usually somewhat bloated; the pulse small, feeble, and languid; and the muscular powers debilitated. In such cases, the hemorrhage will sometimes continue with but short intermission until the system becomes almost entirely exhausted, and anasarcous effusions take place in the extremities and face, with occasional paroxysms of violent palpitation of the heart, and a peculiarly pallid and bloodless appearance of the surface. In instances of this kind, the sulphuric acid with cinchona, tincture of cinnamon, chalybeate preparations, and particularly the acetate of lead with small portions of opium, will, in general, afford considerable relief. In such cases, the *tincture of cinnamon*, so generally recommended by the German writers in passive hemorrhages, will often produce very excellent effects. From thirty to fifty drops of it may be given every three or four hours in conjunction with from eight to ten grains of the prussiate of iron. I have witnessed the good effects of these two articles in a case of remarkable obstinacy. There is no remedy, however, which, in general, produces such speedy salutary effects in chronic cases, connected with great languor and relaxation, as *aloes, in small doses*. This article is highly recommended by Jahn in cases of this kind,† for although one of the most improper medicines in the active or ordinary forms of the complaint, experience has shown that where the hemorrhage depends on debility or relaxation of the vessels, both in menorrhagia and in hemorrhoids, it is calculated to produce much good, by its tendency to excite the action of these vessels. Under the head of menorrhagia, I have already spoken of my experience with small doses of aloes in the passive form of the disease, and in relation to the present affection, I can affirm that its effects in two instances were very prompt and most beneficial. Jahn prefers the watery extract of this article, but I have given it as we find it in the shops, in conjunction with small doses of ipecacuanha.‡ The diet in such cases should be nourishing, but not stimulating, such as animal broths, jellies, soft-boiled eggs, &c. Benefit will also result from astringent injections, particularly solutions of alum, sage tea, infusions of the root of geranium maculatum, of the blackberry root, &c.

Treatment of hemorrhoidal tumors, or blind piles.—When these tumors are situated on the margin of the anus, they may, in general, be kept from causing any particular inconvenience, by always washing them with cold water after going to stool, and applying moderate pressure, by means of a soft linen compress laid on them and secured by a T bandage. When they become irritated and painful, without much inflammation, washing them with cold water, and the use of mildly astringent and anodyne applications,§ will usually afford consider-

* ℞.—Pulv. nitrat potassæ ʒiss.
Aq. fontanæ ʒvi.
P. g. Arab. ʒiii.—M. S. Take a tablespoonful every two hours.

† Klinik. der Chron. Krankh., bd. iii. p. 557.

‡ ℞.—G. aloes Soc. grs. xx.
Pulv. ipecac. grs. xxx.—M. Divide into forty pills. Take one every morning, noon and evening.

§ ℞.—Axungiæ ʒi.
Cerussæ ʒi.
Pulv. opii ℈ii.—M. ft. ungt.

able relief; but the ordinary astringent ointments, particularly those made of powdered nutgalls, are often decidedly injurious; and where the inflammation is violent, they are almost always highly pernicious. The most soothing application I have ever used in cases of irritated and painful piles, is the following ointment.* To keep the bowels in a soluble state, where there is much irritation, the lenitive electuary, in union with powdered nitre, is an excellent medicine.† It is necessary, however, to guard particularly against *purging;* and where there is much inflammation present, this observance is especially important. The feces should be kept soft, but not liquid; and one such evacuation daily will be sufficient.

When the piles are inflamed, all astringent applications, with the exception of poultices made with lead water, should be avoided. The patient must remain in a recumbent posture; and as the inflammation is almost always the consequence of some degree of strangulation of the tumor, by the contraction of the sphincter ani, an attempt should be made to press them within the sphincter. In many cases, however, the pain caused by even the slightest pressure is so intense, and the tumors are so much swollen, that all attempts to return them are abortive. In this case we must previously endeavor to reduce the inflammation; and for this purpose, emollient fomentations and cataplasms—or cold lead water must be applied, and where the pulse is active, an efficient blood-letting from the arm should be practiced. I have also known much good derived from the above-named mixture of nitre and lenitive electuary, given in small doses, so as not to procure an evacuation for the first twenty-four hours. The patient should take nothing but toast water, and very thin farinaceous preparations for his food. Some writers have recommended the application of leeches to inflamed hemorrhoids, but the advantage to be derived from this practice is seldom considerable. Montégre is decidedly opposed to local depletion in this way, and thinks that leeches applied to the inflamed hemorrhoids tend often to aggravate the symptoms, by irritating and determining the blood to the parts. Scarifying the tumors, or making free incisions into them, will in general do more towards the reduction of the inflammation than any other applications. Dr. Hartshorne tells me, that he always pursues this practice in cases of inflamed piles; and he has never known any dangerous consequences to follow the operation, but almost invariably unequivocal benefit. As soon as the inflammation is sufficiently reduced to enable us to press up the tumors within the sphincter, it should be done; and cold water, with a small portion of the acetate of lead dissolved in it, cautiously injected into the rectum. Nothing produces a more soothing effect than cold injections in moderately inflamed piles; more especially when they are situated in the sphincter. Montégre places great reliance on the use of such injections, where the inflammation is not very intense, and where, moreover, the piles do not bleed.

To relieve the pain and irritation which arise from *fissures and ulcers* of the lower part of the rectum, some surgeons recommend the removal of the tumors by which the pain is usually kept up; and there can be no doubt of the propriety of this practice, where other means fail to procure relief. The application of caustic, and gentle escharotic ointments or lotions, will in general be necessary, where the ulcers assume a chronic character, with elevated and indurated edges; but undoubtedly the most effectual measure is excision of the tumors, or of the ulcerated part, when they are accessible to the knife.

The excruciating intermitting pains which occur after each alvine evacuation, and in many cases without fissure or much inflammation, apparently from an extreme sensitiveness of the nervous extremities of the affected parts; and which

* Take two ounces of lard and a drachm of flowers of sulphur; mix and rub them together between two plates of lead, until they acquire a black color.

† ℞.—Elect. lenitivi ℥i.
Pulv. nitrat. potass. ʒi.—Misce. Take a teaspoonful once or twice a day.

Montégre calls *nervous hemorrhoidal pains*, are more effectually relieved by cold ablutions and injections than by any other applications that have as yet been recommended. M. Montégre, who dwells particularly on this remedy, states, that he was led to resort to it from having observed, that "when patients affected with the complaint happened to discharge their feces while bathing in a river or the sea, they sometimes escape the torment which ensued when they used a common commode." I have known much relief obtained from the application of the following liniment to the protruded piles, after having washed them with cold water.* Having applied the liniment, the tumors must be pushed up within the sphincter.

It is in cases of this kind that Ward's paste will occasionally procure very considerable relief.† I have used this electuary in a number of instances, and sometimes with great advantage. Dr. Gregory very justly observes, that although it may be very difficult to explain on what principle this stimulating mixture proves useful, experience has fully demonstrated its powers.

When, from a state of chronic irritation or inflammation of the mucous membrane of the rectum, there is a profuse or troublesome leucorrhœal discharge from the anus, recourse may be had to the internal use of balsam copaiva, oil of turpentine, or the cubebs, and slightly astringent injections should be thrown into the rectum three or four times daily. For this purpose a weak solution of sulphate of copper, (one grain to an ounce of water,) will in general answer very well.

Where, however, the pain arises from hemorrhoidal tumors of a permanent character, located either on the margin of the anus, or high up, and brought to the view only by pressing down as in going to stool, the removal of them by ligature or the knife, may be considered as the only means for effecting a radical or effectual cure; and this may always be safely done where the local inflammation and general irritability of the system are not very great, or when no *habitual* hemorrhagic discharge has been established.

Where alarming consequences, or symptoms of general ill health, follow the suppression of hemorrhoids, we should endeavor to re-establish the complaint. This may usually be done without much difficulty by *aloetic* purgatives, small doses of the extract of savin, stimulating enemata, particularly terebinthinate or aloetic injections, leeching about the anus, semicupia, and cupping in the neighborhood. Richter strongly recommends the following combination for this purpose.‡

Sect. IX.—*Jaundice.*—*Icterus, aurigo, morbus regius, morbus arcuatus.*

Jaundice consists in a disordered state of the liver or of the biliary passages, characterized by yellowness of the eyes and skin; clay-colored feces; a highly bilious urine; and generally by a languid state of the circulation.

In many instances the disease approaches very slowly and insidiously. It

* ℞ —Ol. amydalor. ℥i.
Extract. stramonii ℥i.
Sulph. morphiæ grs. vi.—M. ft. linimentum.

† ℞.—Pulv. rad. enul. campan.
Pulv. peper. nig., āā ℥viii.
Pulv. sem. fœnicul. ℥xii.
Mel. despumat.
Sacch. albi, āā ℥xvi.—The first three are to be intimately mixed; then melt the honey and sugar over a fire into a clear syrup; add the other ingredients and form an electuary.

‡ ℞.—G. aloes.
G. assafœtid.
Extract. hellebor. nig.
Ferri sulphur.
Croci orient. ℥i.
Mucilage g. Arab. q. s.—Divide into grain pills. Take from five to eight every evening.

commences with a general feeling of languor, disinclination to bodily and mental exertion, an irritable and dejected temper, weakness of appetite, constipation, acid eructations, slow and painful digestion, slight flatulent pain in the bowels, a feeling of fullness and slight tension in the epigastrium; anxiety in the præcordia, restlessness at night, a turbid urine usually depositing a copious pitchy sediment, slow and languid pulse, more or less nausea, and frequently transient creeping chills alternating with flushes of heat. After these symptoms have continued for a few days, a disagreeable itching over the whole body occurs; the taste becomes bitter; the stools whitish or clay-colored; the urine of a deep saffron hue; and finally the white of the eyes, and the skin about the lips, neck and forehead assume a yellow color, which speedily extends itself, until the whole surface acquires a uniform yellow hue. When the disease has arrived at this stage, the general debility and sluggishness, as well as the uneasiness and tension in the epigastrium, increase, and although the pulse is generally slow, full and somewhat firm, slight febrile exacerbations almost always take place in the evening, with some augmentation of the temperature of the skin, and occasional transient sensations of chilliness, with much restlessness during the night. The skin is generally dry and husky. If the disease continue a long time, the body begins to emaciate; the evening febrile exacerbations become more conspicuous; night sweats ensue; and in many instances, dropsical effusions at last take place into the cavity of the abdomen; respiration becomes anxious and oppressed, and where it verges to a fatal termination, a soporose and torpid condition comes on towards the conclusion.

In some instances, however, the disease comes on so insensibly that no particular local or general manifestations of its approach are noticed until the eyes and skin begin to assume a yellow hue. When the disease makes its appearance in these two ways, it depends probably on a morbid viscidity of the bile, in consequence of which, its passage from the liver into the intestines is impeded or entirely prevented.

Sometimes, instead of the gradual manner just mentioned, the disease commences at once with severe dull pain a little below and to the right of the pit of the stomach, increasing rapidly in violence, with excruciating exacerbations, spreading towards the left shoulder down to the loins, and throughout the whole epigastric region; at the same time, the patient experiences almost incessant and extremely distressing nausea, attended with so great a degree of gastric irritability that everything swallowed is immediately thrown up again with the most violent and painful vomitive efforts. In such cases, the epigastrium is distended, and generally tender to the touch; but the pulse usually differs but little from its natural condition. When the disease comes on in this manner, it commonly depends on obstruction of the common duct by a biliary concretion.

The intensity and brightness of the icteric color differ very considerably in different cases. In some instances, it is of a golden-yellow, in others of a greenish-yellow, and in others again it acquires a dark and almost black shade.* The latter two varieties are, generally, connected with organic diseases of the liver, such as enlargement, induration, and tubercles. In protracted cases of jaundice, the yellow color is not confined to the skin, but pervades almost every part of the body. The adipose structure, particularly, acquires a bright saffron color; and the internal membranous tissues are usually conspicuously marked with the same tinge. It is, however, extremely uncommon to find the brain and nerves pervaded with its color, and its appearance in the cartilages and bones is an almost equally rare occurrence. The fluids, too, become tinged with yellow. Mursinna gives an account of a fatal case of jaundice, in which he found the viscera of the breast and abdomen, as well as the meninges of the brain, of a deep yellow color, and the serum which he found in the pericardium and ventricles of the brain was of the same color *and of a bitter taste.*†

* Cases of this kind are usually called black jaundice, (*melasicterus.*)

† Journal für die Chirurgie, bd. ii. s. 222.

It is from the tinge being communicated to the humors of the eyes, that to some jaundiced patients all objects appear of a yellow hue. Of the secretions, the *urine* is most conspicuously charged with the bilious coloring matter. It is so abundant in this fluid, that pieces of linen or paper dipped into it immediately acquire a yellow stain. In the *milk* of women affected with this disease, the color and the taste of bile are hardly ever detected. Heberden, indeed, asserts that the presence of bile in this secretion has never been noticed; but in relation to the *taste*, I have myself observed an instance in which the milk was very perceptibly bitter. Dr. Good thinks that the cause of the very rare occurrence of yellowness in the milk of jaundiced females, arises "probably from its rapid passage and elaboration from the fluids introduced into the stomach." I am inclined to think that this circumstance depends on the bile uniting with the oily portions of the lacteous secretion, and becoming thus suspended with it in the form of an emulsion. We know at least that in the duodenum, it is entirely owing to the union of the bile and the fatty portions of the chyme, that the chyle obtains its milky color;* and it is not improbable that the union of oily and bilious matter may, in part, destroy or precipitate the bitter principle of the latter. This, at all events, must be the case in the duodenum; for, notwithstanding the union of the chyme and bile, the fluid in the lacteals, resulting from the combination, and the thoracic duct, is wholly free from bitterness.

The duration of an attack of jaundice is extremely various, and depends, of course, almost entirely upon the greater or less degree of permanency of the occasional cause. In some cases the icteric symptoms come on rapidly under symptoms of great violence, and in a short time disappear again. This is most apt to be the case when the disease arises from the passage of a biliary concretion through the common duct, or from spasmodic constriction of this part. Sometimes the disease is marked by manifest remissions, the yellowness of the skin and other symptoms increasing and abating at short but regular intervals for a long time. Not unfrequently this malady assumes a strictly chronic character, without any particular feelings of ill health except slight dyspeptic symptoms, costiveness, and a disposition to indulge in sleep. More commonly, however,

* Mr. Brodie, from some experiments he performed, inferred that the principal purpose of the bile is to separate the chyle from the chyme; for he remarked, that, when the choledochus duct was secured by a ligature, and food then given, chymification went on in the *stomach* as usual, but no chyle could be found in the intestines or in the lacteals. The lacteals contained a transparent fluid, which he supposed to be lymph and the watery part of chyme. Herbert Mayo draws the same results from his experiments. These results are at variance, however, with the experiments of Leuret, Lassaigne, Tiedemann, and Gmelin. The former, after tying the duct and clearing out the bowels with castor oil, fed the animal, twelve hours after the operation, with bread, milk, and sugar. Eight hours after this meal, the animal was killed. The food was found digested, and "the thoracic duct was distended with a yellowish-red transparent fluid, *which coagulated on standing exposed to the air, and yielded the usual proportion of fibrin, albumen, and saline matters.*" Brodie, Mayo, Leuret, Lassaigne, Tiedemann, and Gmelin, observed that chymification went on as perfectly after the common bile duct was tied as in a sound animal. In the experiments of Tiedemann and Gmelin, the thoracic duct always contained an abundance of fluid, which was generally of a yellowish color, (confirming in this respect the experiments of Leuret and Lassaigne, and partly also those of Brodie and Mayo.) This fluid coagulated like ordinary chyle; the crassamentum acquired the usual red color; in short, the only difference between it and the chyle seen in a sound animal, was, that after tying the common duct it was never white or milky. The reason of this difference appears to be, that the white color is owing to fatty matter taken up from the food by means of the bile, which possesses the power of dissolving fat, and probably, therefore, aids in effecting its solution in the chyle at the mouths of the lacteals. "Mr. Brodie appears to have been misled by the absence of the white color which the chyle usually possesses; but which it is well known equally to want in ordinary digestion, if the food does not contain fatty matter." Tiedemann and Gmelin confine the agency of the bile in chylification, simply to the accomplishing the solution of the fatty matter. These experimentalists believe that the biliary secretion, besides its agency in chylification, is supplementary to the function of the lungs in freeing the blood of its carbonaceous and other heterogeneous principles.

protracted instances of the disease ultimately cause great emaciation and dropsical effusions, and often terminate in a state of apoplectic stupor.

Causes.—The etiology of jaundice is, in many respects, still involved in much obscurity. In a general way, it may be said, that all the remote causes of this disease act either by obstructing or preventing the flow of bile from the liver into the intestines; or by impeding, deteriorating, or suspending the secretory action of the liver. Of the former kind of causes are: 1. Biliary concretions plugging up the duct. 2. Spasm of the duct, which may be excited by acrid bile, duodenal irritation, and perhaps violent mental emotions. 3. Viscid mucus clogging up the orifice of the common duct. 4. Inflammation and thickening of the coats of the duct. 5. Enlargement and induration of a neighboring part, particularly of the pancreas, and perhaps of the mesenteric glands.* 6. Preternatural viscidity of the bile, by which its flow along the duct is greatly impeded, or altogether prevented; pregnancy, and impacted feces in the colon. When, by any of these causes, the bile is prevented from flowing into the intestines, and thereby congested in the biliary passages, it is generally believed to gain admission into the current of the circulation either by absorption or regurgitation, and to be afterwards secreted into the subcuticular tissues, giving rise to the yellow tinge of the surface. It is quite certain, indeed, that the jaundice will generally supervene speedily when an obstruction of this kind occurs in the common duct; and, from the manifest presence of bilious matter in some of the secretions, we can scarcely doubt that in relation to such cases, this view of the etiology of the disease is, in the main, correct. MM. Tiedemann and Gmelin, in their interesting account of a series of experiments on digestion, state, that on passing a ligature round the common duct of animals, they found that about the third day the eyes became yellow, and the urine strongly imbued with a coloring matter, which, by chemical tests, they ascertained to be bile.† To this doctrine it has been objected, that no bile has ever been detected in the blood of patients affected with jaundice, a circumstance which certainly does not countenance the opinion that bile enters the circulation by *regurgitation*. Against the opinion that the biliary secretion is *absorbed* into the circulation, it is alleged that it is not at all probable that a fluid so irritating as the bile is, would be received by the extremities of the absorbent vessels, and there is much plausibility in this observation. Nevertheless, when we find the bile making its appearance in the urine, and often in the other secretions, together with a uniform yellow tinge, not only of the surface of the body, but also on the internal organs, at the same time that the white or clay-colored feces show that there is no bilious matter poured into the intestines; and when, finally, dissection discovers to us a complete obliteration or obstruction of the common duct, we are forced to admit, that in consequence of the engorgement of the excretory ducts of the liver, from the exit of the bile through its natural passages being obstructed, it is in some way or other abundantly secreted by the kidneys, and its coloring matter at least copiously deposited in the subcuticular and various other textures of the body. The admission of the bilious matter into the circulation is most likely by *absorption;* but it is not probable that the bile is thus introduced into the blood-vessels in its state of complete combination. The serous and coloring matter alone may, perhaps, be taken up by the absorbents, while the most acrid and

* An interesting case of jaundice, which terminated fatally, is related in the *Journal de Progres*, and in which the following phenomena were discovered on post-mortem examination. "Two or three inches from the origin of the duodenum there was a tumor with elevated edges, rather larger than a crown piece, the surface of which was uneven, very hard to the touch, of a whitish-yellow color, and very vascular. The different coats of the intestines were involved in the disease, which included, at one of its edges, the openings of the biliary and pancreatic ducts, which were extremely contracted and almost annihilated. The gall-bladder was extremely distended, and, when strongly pressed, a few drops of bile issued forth into the duodenum."—*Med.-Chir. Rev.*, July 1828, p. 440.

† Recherches Experimentales Physiologiques et Chymiques sur la Digestion, second partie, p. 47.

irritating portions are left in the liver. Both Deyeux* and Clarion† found in the blood of patients laboring under jaundice a considerable portion of a yellow matter, which communicated a saffron stain to liver, just as the urine of such persons is known to do.

Among the above-mentioned causes of obstructions to the flow of bile into the intestines, the most common undoubtedly are, biliary concretions, spasm of the duct, and preternatural viscidity of the bile. A very viscid state of the bile is probably much more frequently concerned in the production of this disease than seems to be generally supposed. Dr. Annesley, in his work on the diseases of India, states that he frequently found, upon post-mortem examination, "the gall-bladder loaded with a bile of a dark-green color and so thick and viscid that it could scarcely be forced through the ducts by squeezing the gall-bladder, although the blow-pipe or probe would pass readily along them, showing that the obstruction was then owing to the viscidity alone." When the disease is preceded and accompanied by a constant aching and soreness, with occasional extremely severe paroxysms of pain in the right epigastrium, together with great irritability of the stomach, we may infer that it arises from the passage of a gall-stone through the common duct. The suffering, in cases of this kind, after a longer or shorter period, suddenly ceases; and this occurrence may be considered as announcing the entrance of the calculus into the duodenum. From some late pathological researches by Andral, it appears that irritation and inflammation of the mucous membrane of the duodenum sometimes produce jaundice where no obstruction can be detected in the biliary ducts; and it is perhaps in this way that the jaundiced hue of the skin is produced in yellow and other severe forms of bilious fever. Dr. Marsh has also related some cases which render it probable that inflammation of the mucous membrane of the duodenum is sometimes extended to the lining membrane of the ducts, whereby a contraction of these passages is produced, either by spasmodic constriction or by a thickening of their coats.

Dr. Marsh observes, that hysterical women, of a relaxed and gross habit of body, are subject to a form of jaundice which, though strongly resembling those cases that arise from the impaction of a gall-stone in the common duct, appear, nevertheless, to owe their origin to a less permanent cause. Some mental commotion, and particularly an error in diet, seems, in most instances of this kind, to be the remote cause of the disease. These come on like a violent attack of bilious colic, or with symptoms resembling those which occur from the passage of a biliary concretion through the common duct. "A pain," says Sydenham, "not less severe than that of the iliac passion, is felt at the region of the stomach, or somewhat lower, which is succeeded by copious vomitings of matter, sometimes green, sometimes yellow. To these symptoms are added, a depression of mind and despair exceeding that in any other disease. *It is accompanied sometimes with a remarkable jaundice, which spontaneously subsides in a day or two.* The least commotion of mind, whether it be anger or fear, brings back the pain." When the pain subsides, large quantities of flatus pass off, either upward or downward; and the ejections from the stomach, during the continuance of the pain, are usually acid. I have attended an elderly lady in this city, who is precisely of the habit of body just mentioned, in five or six paroxysms of this kind. The disease always commences like a violent attack of bilious colic, attended with vomiting of a green and acrid bilious fluid. It seldom lasts longer than about forty-eight hours, by which time the surface of the body begins to become yellow, and soon acquires a deep jaundiced hue. In nearly all the attacks, I have been able to trace its origin to errors of diet or some mental commotion. Dr. Marsh says these cases may, in general, be readily recognized by the copious

* Considerations Chymiques sur le Sang des Icteriques.—Journal de Médecine, Messidor an. xii. p. 288.

† Considerations Chymiques et Médicinales sur le Sang des Icteriques, Presentées et Soutennues à l'école de Med.

secretion of limpid urine which occurs in them. This, however, is only correct with regard to the appearance of this secretion in the very commencement, for commonly in the course of thirty-six hours from the beginning, the urine becomes bilious, as in other instances of jaundice. The leading proximate cause, in cases of this kind, is probably spasmodic constriction of the gall-ducts, or preternatural viscidity of the bile. Duodenal irritation, from flatus or acrid bile, and imperfectly elaborated chyme appear to constitute the principal exciting causes of this variety of the disease. Leeches, fomentations, abstinence from food, purgatives, and *full doses of opium*, will always soon relieve the painful symptoms of the complaint.

Jaundice, as has been already intimated, may be produced also by causes that act upon the liver through the medium of the general system. Some of these causes appear to produce torpor of this organ, and consequent suspension of the biliary secretion; others, perhaps, give rise to the secretion of acrid bile; which, stimulating the ducts, may occasion spasm and retention of the biliary matter in the hepatic ducts; and others, finally, gradually produce more or less disorganization of the liver. Of this variety of causes, are—intemperance in the use of spirituous liquors; irritating substances in the primæ viæ; suppression of acute and chronic cutaneous eruptions; violent mental emotions, particularly grief;* constipation; suppressed perspiration; the slow influence of malaria; wounds of the scalp; metastasis of gout; and perhaps mercury.†

That the cessation or great diminution of the biliary secretion, whether from mere functional torpor or structural alteration of the liver, is capable of giving rise to jaundice, admits of no reasonable doubt. Cases of fatal jaundice have been reported, in which, upon post-mortem examination, the ducts were found entirely unobstructed, and the small portion of the bile found in the gall-bladder and liver, of a natural consistence.‡ When the elimination of the recrementitious matter which enters into the composition of the bile is not duly effected by the organ destined for this office, the blood will necessarily become surcharged with this matter, and by a natural tendency of the animal economy to cast off what may be injurious to its welfare, the kidneys, as well as the general capillary system, will in a manner perform the office of the liver, and free the blood of a portion of its superabundant biliary elements, by depositing them into the subcuticular textures, as well as into other tissues, and particularly also in the urinary secretion.

Prognosis.—The prognosis of jaundice varies of course according to the nature of the occasional cause, and the general vigor of the system. When the disease does not depend on organic affection, or obstruction of the common duct by large biliary concretions, it may, in general, be removed without much difficulty. Cases arising from violent anger, spasm of the duct, mucus clogging the orifice of the duct, and on preternatural viscidity of the bile, are often speedily removed by an appropriate treatment. In many instances arising from biliary concretions, the obstructing calculus is not so large as to cause it to be very long in passing through the duct into the duodenum; and such cases, though often attended with extreme pain and gastric disturbance, usually disappear in the course of eight or ten days; but where the disposition to form biliary concretions is strong, which is not uncommonly the case, the paroxysms of suffering and

* Dr. Marsh gives an account of a case, where a young girl, in the Lock Hospital, who had got cold while under the influence of mercury, was suddenly informed of the death of her uncle, the only one of her relations who had treated her with kindness; she immediately became universally jaundiced.—*Dublin Hosp. Reports*, vol. iii. art. 6.

† Dr. Colles communicated an instance to Dr. Marsh, where a young gentleman, after undergoing an alterative course of mercury, suddenly became deeply jaundiced. In a few days afterwards he died, in a state of delirium and convulsions. On dissection, not the slightest change of structure was discovered. The internal as well as external parts were strongly tinged with bile.

‡ Stoll, Ratio Medend., vol. iii. pp. 361–366.

jaundice are apt to recur again and again, at longer or shorter intervals. It is said, that jaundice occurring in consequence of injuries of the head, is, in general, particularly dangerous, and difficult to be removed.* The supervention of stupor, coma, or delirium, is always an extremely unfavorable sign. When the icteric tinge acquires a very dark appearance, approaching to a blackish hue, we may infer that the disease will be very obstinate, or probably altogether incurable; for such cases are almost always dependent on incurable organic affection of the liver, or of the neighboring organs. If, in cases of this kind, copious hemorrhages occur from the nose or lungs; or if violent colic pains and profuse colliquative diarrhœa come on, the prognosis may be regarded as extremely unfavorable.† When the perspiration is so copiously charged with the coloring matter of bile as to communicate a yellow tinge to the patient's linen, there is reason to apprehend a total and obstinate obstruction to the passage of the bile into the intestinal canal. (Jahn.) The occurrence of tympanitis, dropsical effusions, slow febrile irritation, emaciation, and great muscular debility, leaves us but little hope of an eventual recovery.

Treatment.—From what has already been said concerning the etiology of jaundice, it is manifest that the treatment requires considerable modifications, according to the particular condition of the biliary organs, upon which the symptoms of the disease depend; for it should be recollected, that the phenomena which we denominate jaundice, are mere manifestations of some local or sympathetic disorder of the biliary organs. When the disease commences with violent pain in the epigastrium, with constant nausea and frequent vomiting, we may ascribe it either to a spasmodic affection of the bile ducts, and perhaps of the duodenum, from some local or sympathetic irritation; or to the impaction of a biliary concretion in the common duct. In cases of this kind, our principal object, in the first place, must be, to relieve the extreme sufferings of the patient; and for this purpose, opium, the warm bath, leeching, frictions, and emollient applications to the epigastrium, are almost the only appropriate remedies. If the patient be robust and very plethoric, blood should be at once drawn to an extent sufficient to make a decisive impression on the system. I am inclined to think that blood-letting is too much neglected in cases of this character. I have, in several instances of jaundice, commencing in the way just mentioned, procured manifest advantage from an efficient abstraction of blood. Blood-letting may prove beneficial in various ways in this affection. By it we lessen the tendency to inflammation in the irritated parts; and it may favor the passage of biliary concretions through the duct, by its general relaxing powers. But it is also a very proper preliminary measure to the employment of *opium*, upon the liberal use of which our principal reliance must be placed for palliating the painful symptoms. During the first stage of cases of this violent character, emetics, and even purgatives, are out of the question—at least until the gastric irritability has been in a great measure allayed. After having drawn blood, where this evacuation is indicated by the pulse and general habit of the patient, a large dose of opium in union with calomel, should be immediately administered. Small doses of this narcotic will do no good—on the contrary, they often appear rather to add to the general distress of the patient. From four to five grains of opium, with ten or fifteen grains of calomel, should be given at once. When administered in such a dose, it rarely fails to allay the pain and gastric distress in a few hours. But in some instances, even this quantity is not adequate to remove the extreme sufferings of the patient, and it becomes necessary to repeat it in smaller doses, until the desired effect is produced. It is not, however, simply as an anodyne, that this narcotic may be beneficially employed in painful cases of jaundice unconnected with febrile irritation. When the pain and obstruction to the flow of bile into the intestines are the result of spasm of the duct, we can resort to no

* Jahn. Klinik. d. Chronisch. Krankheiten, b. ii. p. 395.

† Richter's Specielle Thérapie, b. iv. p. 315.

remedy more directly calculated to remove this condition than opium given in very efficient doses. At the same time that we have recourse to this powerful narcotic, the bowels should be emptied by purgative enemata, repeated until a free evacuation is procured. Much benefit may sometimes be obtained from the warm bath, and where its employment is practicable, it ought to be resorted to in conjunction with the measures just indicated. If by these means we succeed in allaying the violence of the symptoms, we may then have recourse to purgatives and emetics. The latter have been very generally recommended in cases where there is reason to apprehend the presence of a biliary concretion in the common duct. The relaxation and concussive agitation produced by the operation of an emetic, may contribute materially to expedite the passage of the concretion through the duct, an event which must be deemed essential to the removal of the disease. We are told by Dr. Darwin, that in two instances he saw upwards of thirty gall-stones voided by stools soon after the operation of an emetic. We must not, however, forget, that great pain in the epigastrium, with irritability of the stomach, and a universal jaundiced hue of the surface, may arise from high irritation, or inflammation of the mucous membrane of the duodenum, without any obstruction from biliary concretions; and in such cases the exhibition of an emetic could not fail to prove injurious. These cases may be distinguished from calculous irritation of the ducts, by the very manifest presence of fever, or rather the small, quick, tense, and frequent pulse, and the warm and dry skin, which occur in duodenal inflammation; and the slow, full, and rather active state of the pulse, and entire absence of the usual symptoms of fever, in cases depending on obstruction to the course of the bile from biliary calculi. Where there is reason to suspect high duodenal irritation, or subacute inflammation, as lying at the foundation of the malady, recourse must be had to leeching, blistering, and fomenting cataplasms to the epigastrium; a bland and liquid diet; laxative enemata; cooling acidulated drinks; small portions of opium and ipecacuanha in combination; and rest. The use of emetics and purgatives is out of the question. Various remedies were formerly recommended with the view of consuming or dissolving the biliary concretions lodged in the liver or its ducts; but the age of confidence in such remedies has passed by, and there is now but little attention paid to articles of this kind, with a view to their resolvent powers, although some of them may do good by their tendency to excite and alter the action of the liver. The alkalies, soap, a solution of the yolks of eggs in vitriolic ether, Durande's mixture, composed of two parts of vitriolic ether and one of spirits of turpentine, the natural mineral waters containing carbonic acid gas in an uncombined state, and mercury, have been most generally employed for this purpose. With regard to the vitriolic ether and spirits of turpentine, Dr. Good very justly observes, that where there is a tendency to inflammation, they may do harm by their stimulant effects. In one case under my care, this mixture appeared to do much harm, for it manifestly increased the general irritation of the sanguiferous system, and gave rise to much epigastric tenderness. Where spasm of the duct may be presumed to be the primary affection, nauseating doses of antimony; hyoscyamus; assafœtida; infusion of chamomile; active purgatives; emollient cataplasms or fomentations; anodyne frictions, and enemata, are recommended by the older writers, but they are so greatly inferior to opium, the warm bath, and revulsive applications to the epigastrium, that they scarcely deserve any attention as remedies in this affection.

In cases that come on gradually, with little or no pain in the region of the duodenum and duct, and where, of course, there is little or no probability of the existence of spasm or biliary concretions, the principal indication is to restore the regular functions of the liver, and alimentary canal. Unfortunately, we cannot determine, with any degree of certainty, whether such instances consist merely of functional torpor of this organ, or of a slow organic change of its structure, or of the gradual formation of an indurated enlargement of the pancreas, or of some other latent affection of the bile ducts, or duodenum near

the opening of this duct, or finally of a loaded state of the colon; and our remedial measures must, therefore, often be applied under much uncertainty as to their fitness to the actual condition upon which the general icteric symptoms depend. The mere empirical prescription of remedies for the remote consequences, or symptoms of the primary hepatic disorder, or for *jaundice*, as is usually said, will not satisfy the scientific physician; and yet, in many cases, the minutest attention to the circumstances and phenomena of the disease, will enable us to form only plausible conjectures as to its true nature. Where there is reason to presume that the primary morbid condition consists in functional inactivity of the liver, mercurials are the principal curative means. As this functional torpor is, however, itself, probably only a consequence of an irritation located elsewhere, particularly in the mucous membrane of the alimentary canal, it will always be especially proper to attend to the state of the bowels in all cases that come on slowly, and without any particular pains in the epigastrium. About two years ago, I had a striking example, illustrative of the propriety of this latter observation. A young man, who had for several years labored under weak digestive powers, became gradually deeply jaundiced, with clay-colored feces and highly bilious urine. The liver was manifestly in a very inactive condition, and although no distinct pain was felt in the epigastrium, moderate pressure about the region of the umbilicus gave rise to great soreness and distress. He had already taken a great deal of medicine, under the direction of another physician, without the least perceptible advantage. I put him upon the lightest kinds of liquid farinaceous diet, and directed him to have fifty leeches applied to the epigastrium, and to use a laxative enema every morning soon after breakfast, and three grains of blue pill every night on going to bed. In less than a week after this treatment was commenced, he began to mend, and in the course of four weeks his health was entirely restored. Jaundice has been known to recur in a strictly periodical manner, and cases of this kind are, perhaps, always intimately connected with intestinal irritation. Bang mentions an instance of periodical jaundice, which, after many other remedies had been ineffectually used, was speedily cured by the application of a large blister over the right hypochondrium. In cases of this kind, unattended with high irritation of the mucous membrane of the intestinal canal, some advantage may also be derived frrom the extract or infusion of taraxacum; and some of the German physicians strongly recommend the infusion of *saponaria officinalis*, a common plant in this country. The taraxacum is supposed to possess considerable powers as a deobstruent; but its usefulness in affections of this kind, if it really possesses any, arises probably from its mild aperient and diuretic operation. Mercurial frictions on the right hypochondrium are highly proper in such cases. A most excellent remedy for exciting the action of the liver, and promoting a healthy secretion of bile, is the nitro-muriatic acid bath, employed in the way mentioned under the head of Chronic Hepatitis, at page 209 of this work. Many highly respectable testimonies might be cited in proof of the beneficial effects of this remedy in cases of chronic jaundice. I have myself used it with marked advantage. Mercury, in alterative doses, and the nitro-muriatic acid bath, appear to be equally well adapted to the treatment of this affection, whether it consists in mere functional torpor of the liver, or in vitiated biliary secretion; and in general, wherever the disease is gradual in its approach, and unaccompanied with distant pain, these remedies deserve a full trial.

When the disease continues a long time, and the icteric hue acquires a dark appearance, there will be much reason for suspecting the existence of some organic affection of the liver. Cases of this kind are almost always entirely beyond the control of remedial measures; yet it will be proper, even under the most unfavorable circumstances, to make an effort to remove, or at least to arrest, the progress of the hepatic affection. External revulsive applications, low diet, and the use of mercury or the acid bath, just mentioned, are the only means upon which the least reliance can be placed in cases of this character. Where

enlargement and induration of the spleen or pancreas exist, the tincture of iodine would, probably, be of service.

Whatever be the precise nature of the hepatic derangement, a strict attention to proper dietetic regulations is of great consequence. The digestive powers are always weak in cases of jaundice, and an error in diet may not only cause great uneasiness and distress from the ordinary affections of dyspepsia, but what is more to be dreaded, may readily give rise to high irritation in the mucous membrane of the duodenum, as well as of the other portions of the alimentary canal, and thus tend, in no trifling degree, to increase the hepatic disease, or to develope inflammations. Where there is tenderness in the epigastrum, and, in general, in all recent cases commencing with violent symptoms, the diet should be of the lightest or least irritating kind. In instances that assume a chronic form, the food should be digestible and simple; and where there is reason to suspect the presence of gastro-enteric irritation, it will not be prudent to allow solid food, even of the lightest and most digestible kind.

There are few cases that have given so great a scope for empiricism as the one now under consideration. Articles of the most opposite, and in many instances of a decidedly pernicious character, have been extolled as specifics for the cure of this affection. The old and exceedingly absurd doctrine of "signatures" gave rise to the employment of the *celandine*,* and there are not wanting many highly respectable authorities in favor of its use in this malady. The *agrimony*, too, was formerly highly extolled for its efficacy in jaundice,† and of late years the *sanguinaria* has been brought forward as a valuable remedy in this affection. This remedy was much praised by the late Professor Smith, of New Haven. He gave the tincture in doses of from thirty to fifty drops three times daily. *Hempseed* boiled in milk, is another remedy which has been said to possess very useful powers for the cure of this affection. Sydenham strongly recommends *rad. rub. tinctor.;* and Baldinger relied much upon the use of small doses of ipecacuanha. It is not improbable that these, and many other remedies that have been mentioned, may, under peculiar circumstances, be occasionally serviceable; but as we are wholly without any rational indications for their use, their employment is a kind of hap-hazard practice, which will be more likely to do mischief than good.

CHAPTER VII.

CHRONIC DISEASES OF THE URINARY ORGANS.

Sect. I.—*Diabetes Mellitus.*

Diabetes was known to the ancient Roman physicians, but it does not appear that they had any knowledge of the essential characteristic of the disease—namely, the saccharine character of the urine. They seem to have considered the disease

* Jahn speaks very favorably of the following combination, where the disease depends on torpor of the liver, and a sluggish condition of the portal circulation:

℞.—Sulph. aurant. antimon. ℈i.
Gum. ammon.
G. assafœtid.
Fel. tauri, āā ʒii.
Extract. chelidonii maj. q. s.—M. Divide the mass into two grain pills. Take from eight to twelve pills four times daily.

† J. Hill. Method of Curing Jaundice and other Diseases of the Liver, by the Herb Agrimony. London, 1769.

only as a rapid discharge, by the kidneys, of whatever drinks were taken into the stomach, without having undergone any changes by the digestive or assimilative functions. "Diabetes," says Ægineta, "est subitus potulentorum exitus, talibus per urinam redditis qualia pota fuerant"—"a sudden discharge of liquids drank, which are voided by the urine, such as they were taken in by the mouth." Celsus, too, says diabetes consists in a greater discharge of urine than there are fluids taken in by the mouth; and Aretæus, who has given an accurate description of the course and phenomena of this disease, defines it in the same way. The saccharine character of the urine in diabetes, was not known or pointed out, until Willis directed the attention of the profession to it; and although this morbid condition of the urine is unquestionably the essential characteristic of diabetes, it has frequently been wholly left out of view in the definitions which have been given of this disease. Cullen himself has fallen into this error in his definition of this malady. "It consists," he says, "in the voiding of a preternatural quantity of urine;"—and in thus neglecting to notice the characteristic quality of the urine, he confounds it with diseases which are radically distinct from it, and which resemble it only in the circumstance of an unusually large flow of urine. There are at least three varieties of urinary disease, which are accompanied with a preternatural flow of urine, but which are nevertheless essentially distinct, as well from each other, as from the disease now under consideration.

By diabetes, then, is meant that form of urinary disease, in which the urine *is sensibly impregnated with saccharine matter, and voided in an unusually large quantity, being attended with great thirst, voracious appetite, and an obstinately dry and harsh skin.*

Diabetes usually makes its appearance in a very gradual manner, although in some instances it comes on suddenly, with slight chills and febrile commotions. When its invasion is gradual, it is generally attended from the first with various indications of a disordered state of the digestive organs—such as variable appetite, acid eructations, occasional nausea, and vomiting.

The quantity of urine discharged in this affection, is almost always extremely great; and in some instances truly enormous. I have seen two cases in which from twelve to fifteen pints of urine were discharged in the course of twenty-four hours, for several weeks. That such a drain from the system must cause great and rapid exhaustion and wasting of the body may be readily conceived; and, indeed, the utmost degree of prostration and emaciation never fails to ensue as the disease advances in its course.

The urine in this disease is generally of a pale straw color, approaching sometimes to a shade of green.* Its smell is usually faint, resembling that of milk, or, according to some, that of fresh animal broths, and its taste is more or less sweet, from the sugar which it contains. Diabetic urine always contains very little or no urea, and in most instances it is entirely destitute of lithic acid. It enters very slowly into putrefactive decomposition, but passes readily into the acetous or vinous fermentation. In these circumstances it differs very essentially from the urine of other varieties of disease resembling diabetes—in which latter it always putrefies with great rapidity, and becomes exceedingly fetid.

Symptoms.—The constitutional symptoms which attend this disease, are—very urgent thirst; craving appetite; dry skin; a distressing sense of weight and uneasiness in the stomach after taking food; dry and parched mouth; white, foul, sometimes clean and red tongue; wasting of the flesh; a feeling of languor and aversion to exercise; debility; pain and weakness in the loins; irregular action of the bowels, being most commonly costive; some degree of inflammation and pain about the prepuce and glans penis, and especially about the external orifice

* Cases have been frequently observed, in which the inordinate secretion of urine has suddenly ceased without any assignable cause. A distressing strangury has been known to supervene on the occurrence of such sudden cessations of the diabetic symptoms.—(Dr. Carter, *Med. Repos.* 1823.)

of the urethra; loss of virility; cold feet, with a tendency to œdema in the latter period of the disease; dull and aching eyes; indistinct vision, with vertigo; headache; and difficulty of breathing. As the disease gains violence, and draws towards the fatal termination, the gums become spongy and the breath fetid or disagreeable, and the voice rough, or extremely weak and whispering. The emaciation and exhaustion proceed with great rapidity towards the conclusion, and the patient finally sinks into a state of somnolency or drowsiness, from which it is often extremely difficult to keep him roused even for a moment. In general, the pulse is but little or not at all accelerated in the early periods of the complaint; but in many instances it is even less frequent than in health. In the advanced stage of the disease, however, when the emaciation and exhaustion are very great, it is not uncommon to find the pulse very frequent and quick. In some instances the blood has been found sizy, or covered with a thick inflammatory crust. Home states, that the blood of one of his diabetic patients manifested a highly inflammatory character, although the pulse was rather below the regular standard in frequency and strength. It is by no means unusual for this disease to terminate in apoplexy—a circumstance somewhat remarkable, when we consider the exhausted and worn down condition of the system in the last period of the disease. In a case which I attended some years ago, the patient became completely lethargic for about eighteen hours previous to death, and during this period the urinary secretion was almost entirely suspended. I suspect, indeed, from this case, as well as from others which have come under my notice, that in all instances where the disease terminates in a state of stupor or lethargy, the secretion of urine is greatly, if not almost entirely suspended. The disease, in such instances, seems to pass from the kidneys to the brain—an occurrence which is not uncommon in *ischuria renalis*.

The duration of diabetes is extremely various. In some instances, not more than four or five weeks intervene between the commencement and the fatal termination of the disease, whilst the majority of cases are protracted to several months, and occasionally to as many years. In some instances considerable remissions occur in the progress of the malady; and cases are mentioned, in which the diabetic symptoms recurred in a strictly periodical manner, with perfect intermissions of longer or shorter duration.

In some individuals there appears to exist a natural or constitutional predisposition to this disease; and there are many instances on record, which go to prove that this predisposition is sometimes hereditary. I attended a young man laboring under this disease a few years ago, in consultation with Dr. Parrish, who had lost his mother and a sister by the same complaint. Dr. Prout mentions several instances of this kind; and similar cases are to be found in other works on this disease.

Mr. Venables has recently directed the attention of the profession to the diabetic affections of children. He thinks that many of the cases that are considered as instances of marasmus, rickets, &c., are intimately connected with morbid and excessive urinary secretions. Several cases of gradual wasting, attended with great thirst and voracious appetite, came under his notice, which he ultimately ascertained to be wholly dependent on diabetic affections. Infantile diabetes, says Mr. Venables, seldom appears till after the child has been weaned. The child, when the disease comes on, will lose its usual flow of spirits, and manifest an obvious state of general indisposition. After some time, it begins to waste in flesh—the skin becoming, by degrees, harsh, dry, and flabby, and very warm. "In the early state of the disease, the bowels are regular, and little or no deviation from the natural and healthy appearance of the alvine discharges is to be noticed. The tongue also, at the beginning, indicates no symptom of disease." After the disease has made some progress, the bowels become disordered, and the alvine evacuations are unnatural—being sometimes greenish, at others dark, and mixed with bile. At a still more advanced stage the abdomen becomes distended and tense, similar to what occurs in chronic enteritis or marasmus. The

pulse is usually accelerated from the commencement, and soon becomes small, tense and wiry. "The most remarkable symptom, however, although it frequently escapes observation, is the inordinate discharge of urine. This discharge increases in quantity so gradually that it is not usually noticed. By the time it has become more remarkable, great thirst prevails." In the advanced stage of the complaint, the brain often becomes more or less affected. Headache, vertigo, and temporary delirium occasionally occur, and when it proves fatal, the patient dies comatose, or apoplectic. The skin is always extremely dry and harsh to the touch; and in general, considerable fever attends during the advanced periods; and this fever is almost invariably of a remitting form. In cases that continue a long time, anasarca, and even general dropsy sometimes supervene.

This is a condensed abstract of the phenomena of this affection, as given by Mr. Venables. That children may become affected with diabetes, cannot be doubted; but there is reason for suspecting, that in the disease just described, the diabetic symptoms are *symptomatic* of gastro-intestinal irritation. In his post-mortem examination, Mr. V. confines himself to the phenomena presented by the urinary organs, a restriction which is much to be regretted.*

Of the *exciting causes* of diabetes our knowledge is as yet but very limited and unsatisfactory. It would appear from the observation of some writers, that males are more subject to the disease than females. According to Rollo, those whose digestive organs are unusually active, and who indulge freely in the pleasures of the table, are most liable to this malady. The free and habitual use of condiments and of vegetable articles of diet, especially the farinaceous substances, is said to favor the occurrence of this disease in an especial manner. Protracted grief; despondency; deep sorrow; chagrin; and a sense of great affliction, when favored by an exclusive vegetable, or by weak and innutritious diet, have been known to give rise to diabetes. Sudden atmospheric vicissitudes, more especially when attended with protracted humidity, are supposed also to be capable of giving rise to this disease.† That the habitual or frequent use of diuretic and spirituous potations should have a tendency to produce diabetes in persons who are naturally predisposed to it, can scarcely be doubted. It is probable, also, that renal calculi have sometimes produced this complaint. Upon this subject, however, all our sentiments are, as yet, in a great measure conjectural; for the disease is frequently found to make its appearance without any assignable exciting cause whatever.‡ Diabetes mellitus has been known to occur sympathetically from pregnancy. A very remarkable case of this kind is related in Dr. Osann's Clinical Reports. During five successive pregnancies, and throughout the whole of each period, the diabetic symptoms were very conspicuous. The quantity of urine discharged was exceedingly great, and on being analyzed, it was found to contain no inconsiderable portion of saccharine matter. The thirst was extremely urgent, but the appetite and digestive powers remained regular, and rather active.§

Pathology.—The opinions which have been expressed concerning the pathological character of diabetes, are very various and contradictory. According to the celebrated Mead, its primary seat is in the liver, and not in the kidneys. Some pathologists have ascribed it to spasm in the secretory organs, and placed it among the spasmodic diseases. Others attribute this disease to suppressed perspiration, in consequence of cold, or some other adequate cause. The most

* A Practical Treatise on Diabetes; with Observations on the Tabes Diuretica, or Urinary Consumption, especially as it occurs in Children, &c. By R. Venables, M. B., &c.

† Ætius asserts that diabetes has been known to occur in consequence of the bite of the *colubar dipsas;* and Frank mentions the same fact from his own observations. Excessive indulgence in venery has also been known to give rise to this disease.

‡ Reil, Home, and others, assert that diabetes is sometimes infectious. This is exceedingly improbable. It is well ascertained, however, that in some districts it is vastly more common than in others. At Colombo, in India, it is so frequently met with, as almost to merit the title of *endemic.*

§ Jahresbericht des Poliklinischen Institutes zu Berlin 1823–4–5, p. 23.

prevalent opinion on this subject, however, is that which ascribes the disease to a laxity of the kidneys, and to a debility of the urinary organs in general. Sydenham, Rollo, Cullen, and others, regarded this affection as depending primarily on a disordered state of the digestive organs, in conjunction with a defect in the assimilating functions. Home also entertained a similar idea concerning the pathology of this disease; he considered it as arising from a defect of the assimilative process. Quite recently, Dr. Ayre has published some observations on this disease, from which it appears that he considers it as depending wholly on chronic inflammation of the kidneys. Dr. Barry maintains, that the grand source of diabetes is to be looked for in the fluids; whilst Dr. Johnson is of opinion that it is a disease of the general system, or at least that its pathology cannot be fixed on any one particular organ; neither in the kidneys, the liver, the stomach, nor the lungs, exclusively.

Whatever may be the essential nature of diabetes, or the primary seat of the disease, it appears quite certain, that the proper functions of the kidneys are greatly deranged or perverted in this disease. That this is the case can admit of no doubt, when we advert to the circumstance, that, according to the experiments of Nicholas, Granville, and Wollaston, the serum of diabetic blood does not contain a particle of sugar. Its presence in the urine can, therefore, arise only from a perverted secretory action of the kidneys; and whatever may be the immediate causes of the functional derangement of these glands, its existence must be regarded as the proximate cause of all the characteristic phenomena of the disease. Another pathological condition, though less demonstrable than the former, is, as I conceive, a peculiar state of the blood, which may perhaps exist as the immediate cause of the perverted renal action. That the constituent elements of the blood are not such as they are wont to be in health, is rendered probable by the effects which different articles of aliment have, both on the saccharine quality, and on the quantity of the urine. If by an exclusive use of animal diet, the secretion of urine becomes less copious, and its saccharine character disappears, the inference naturally is, that by this kind of food the elements of sugar are reduced in the blood, and consequently less abundantly combined by the perverted action of the kidneys. In health, there is always more or less *urea* secreted by the kidneys; but in diabetes, this peculiarly urinary compound is rarely formed in any appreciable quantity, and very often none at all. When we take into view the close chemical analogy which exists between this substance and sugar, it appears extremely probable that the urea, which is secreted in health, is, in diabetes, converted into sugar by the perverted action of the kidneys. According to the analysis of Prout, for instance, urea and sugar are composed of the following constituent elements—

Urea.	*Sugar.*
6.5 hydrogen.	6.5 hydrogen.
20.5 carbon.	40.0 carbon.
26.5 oxygen.	54.0 oxygen.
46.5 azote.	— azote.

Thus the absolute quantity of hydrogen in a given weight of sugar and of urea is precisely the same, while the qnantities of carbon and oxygen of sugar are just double those of urea. From all this it would appear probable, that diabetic blood is deficient in azote, in consequence of which the kidneys are not furnished with a sufficient quantity of this element to form *urea*, of which it constitutes a large constituent part; and therefore sugar, which contains no azote, is the result of the renal action. This idea, first started, I believe, by Wollaston, is rendered still more probable by the effects which an exclusive animal diet has in reducing the quantity of sugar in the urine, and increasing the formation of urea; for the large proportion of azote which animal food furnishes to the blood, supplies this element in sufficient proportion for the formation of *urea* by the kidneys, in consequence of which the secretion of sugar is either much diminished or wholly

arrested. From these observations it is probable, as I have already said, that the blood itself, in this disease, is defective in the regular proportions of its healthy constituent elements. But here we are necessarily led a step further in our inquiries into the pathology of this malady. What is it, namely, that causes this defective or abnormal condition in the composition of the blood? We can think of but one cause, and that is, a defect of the digestive, but more especially of the assimilative functions of the system. Thus, then, it would appear that diabetes is a disease by no means local, or confined in its pathological state—but, on the contrary, one in which the digestive and assimilative functions, the state of the blood, and the particular functions of the kidneys, are all deeply and essentially implicated.

After all, our views concerning the pathology of this mysterious disease, are as yet, in a great measure, conjectural. In this uncertain state of our knowledge, therefore, I may be allowed to throw out a conjecture on this subject, which must be left for future inquiries, either to refute or confirm. It is well ascertained that the bile contains a very considerable portion of a saccharine matter, called *picromel*. May not a morbid condition of the liver, by which this constituent of the bile is prevented from being formed, give rise to the vicarious secretion of a similar substance by the kidneys, and thus produce diabetes? An accurate analysis of the bile of a diabetic patient would throw much light on this point; and until this is done it must remain wholly hypothetical.

Post-mortem appearances.—It is a singular circumstance, that the lungs are almost universally found in a diseased condition, in those who die of diabetes. Dr. Johnson declares, that so far as his inquiries go, there is not a single instance on record, where, on dissection, pulmonic disease was not discovered in persons who had sunk under this disease.*

The kidneys frequently exhibit an increased vascularity; and many writers state, that these organs are often enlarged, soft, flabby, and otherwise diseased. Some traces of disease are also sometimes discovered in the mesenteric glands, in the lacteals, and in the mucous membrane of the alimentary canal. The bladder, also, sometimes exhibits a morbid condition, being considerably contracted, with its coats much thickened and indurated.

The *prognosis* in this disease is always unfavorable; few, comparatively speaking, recover from its attack; and the cure, under the most favorable circumstances, is always tedious and difficult. I have seen but one case of recovery out of six that have come under my care. Cullen and Currie state that they never knew a single instance of this disease having yielded to remedial treatment; and the celebrated Frank succeeded only in two out of ten cases which he treated. Many other physicians have, nevertheless, been much more fortunate in their treatment of the disease; and although it is certainly exceedingly difficult to cure this malady, it is not quite so intractable as Cullen was led to believe.

Treatment.—The plans of treatment recommended in this disease by writers, are as various and discrepant as the notions which have been advanced concerning its pathology. A vast number of remedies have been mentioned, as having been used with success in this intractable malady; but, as they have been generally introduced upon vague and hypothetical grounds, or adopted in a purely empirical manner, there are but few of them which appear now to deserve any attention.

I have already stated that the blood drawn from diabetic patients exhibits, in

* In a recent number of the Strasburg Hospital Reports, Mr. Suroth gives an account of a case of diabetes which proved fatal in a few months. On dissection, no apparent change was discovered in the kidneys, liver, spleen, or pancreas. But in the chest, the morbid phenomena far exceeded the symptoms during life. There were hydrothorax in the left side, hepatization of the left lung, and in its upper portion a large cavernous excavation; universal adhesion of the right lung to the side, but its structure was sound; hydro pericardium; aneurismal dilatation of the pulmonary artery, at least two inches in diameter. The blood was everywhere fluid in the vessels, and mixed with air.

many instances, a decidedly inflammatory appearance. From this circumstance, and from the firmness of the pulse observed in some cases of the disease, a direct antiphlogistic treatment has been proposed, and successfully practised by several eminent physicians. Mr. Watt, of Glasgow, who, I believe, first resorted energetically to the depletory plan of treatment in this disease, has adduced several very interesting examples of its efficacy in this affection. Since the publication of his valuable work on this malady, venesection has been frequently resorted to, both in Europe, and in this country; and cases have been reported in which its usefulness appears to be well attested. It is, indeed, pretty generally admitted, that the abstraction of blood may, in some cases at least, be very advantageously practised, although there are very few, I think, who would be willing to accord to it as much importance as is done by Mr. Watt. Dr. Prout observes, that in recent cases of a manifestly phlogistic character, blood-letting is often a very valuable remedy. In very protracted instances, however, occurring in old and infirm subjects, and, indeed, in all cases attended with great debility, it is scarcely necessary to observe, that this remedy can very seldom be required. In one of the cases which I treated some years ago, the pulse was such as induced me to think advantage might be obtained from the abstraction of a portion of blood. The patient was accordingly bled to the extent of fourteen ounces, but instead of the benefit which I anticipated, an obvious aggravation of the affection was the consequence. It must be observed, however, that the only case which I have ever succeeded in curing was bled twice, and the pulse in this instance was by no means very active, or hard, nor did the blood drawn exhibit the inflammatory crust. It appears, indeed, that blood-letting is, in general, better borne by diabetic patients with a feeble state of the circulation, than in most other affections under the same state of arterial action. Mr. Watts relates a case of diabetes in which the pulse was slow, feeble, and irregular; there was also great prostration of strength, and the lower extremities were cold and œdematous. The blood was very dark, with a crassamentum as black as pitch, and wholly devoid of tenacity. Notwithstanding these appearances, the lancet was freely employed, and the result showed that it was proper and judicious. The bleeding was repeated six times, and it was not till the fourth repetition of it, that the appearance of the blood was changed, the crassamentum having now become dense and sizy on the top. On the fifth bleeding, the buffy coat was contracted to the size of a quarter of a dollar; after the sixth it was still firmer, and the serum exhibited a white milky appearance. The patient felt better after every bleeding, and he recovered without much difficulty. In a late number of Majendie's Journal, (1828,) M. Lefevre has related a case of this disease which was successfully treated by blood-letting, in conjunction with an exclusive animal diet, the use of milk and lime-water, and the hot bath every evening. Dr. Venables agrees with Dr. Watt, in regarding blood-letting as a valuable curative means in this affection. "We should not be deterred," he says, "from repeating the bleedings, merely because the blood does not exhibit the buffy coat. I have generally found that a dense milky appearance of the serum indicates inflammatory action, and this independently of the appearances presented by the coagulable part. I have found the pulse rise under such circumstances after venesection, and a repetition of the operation required. He prefers repeated small bleedings to fewer larger ones. Upon the whole, I think it may be concluded that venesection is a remedy which deserves considerable attention in the treatment of this disease, although it is certainly by no means so generally salutary as was supposed not many years ago.

Local bleeding by means of leeches and cups, has also been resorted to with excellent effect. Dr. Ayre, who considers this disease as depending on chronic inflammation, or inflammatory irritation of the kidneys, considers the application of leeches or cupping over the region of the kidneys as the most effectual means we possess, for subduing this malady. It appears, however, that he has founded both his theory of the pathology of the disease, and his high opinion of the effi-

cacy of local depletion, on the fortunate result of but a *single* case; a foundation which, it must be confessed, is much too infirm to justify us in placing any great reliance on his experience in this respect. I should be inclined to prefer cupping to leeches, as the former, besides its evacuant effect, is decidedly the most powerful derivative measure.

Opium.—There is no article which possesses so much reputation as a remedy in diabetes as opium. Since the time of Ferriar, there have, perhaps, been few cases of diabetes treated in England and in this country, in which this powerful narcotic has not been tried in some form or other. Without speaking in very extravagant terms of its efficacy in this disease, general experience justifies the declaration that it is one of our most useful remedies in this malady. Besides its tendency to diminish the inordinate secretion of urine, it is particularly useful in subduing that nervous irritability which, in most cases, becomes so distressing in this disease. Dr. Warren was one of the first who employed this narcotic extensively in this affection. (*Lond. Med. Trans. College of Phys.*, vol. iv.) Dr. Ferriar also used it in nearly all the cases he relates; he gave it in combination with bark and uva ursi, in the proportion of a scruple of each of the latter to half a grain of the opium, three or four times daily. In conjunction with this combination, he directed the use of lime-water and an animal diet. Prout regards opium as decidedly the best remedy we possess for the cure of this affection; and of all its preparations, he thinks Dover's powder is the best. It must not be forgotten, however, that where the pulse is strong and firm, blood-letting is an important, if not an essential, preliminary to the employment of this narcotic. "The first immediate effect of opium upon the urine," says Prout, "is to increase its specific gravity. This depends on the diminished secretion of water, while the sugar remains unaltered, in consequence of which the urine is rendered more concentrated, and consequently heavier. As the remedy is persevered in, the urine acquires its original specific gravity, and becomes even lighter. The quantity of sugar is diminished, and that of urea much increased, sometimes so much so as to become greater than natural. Lithic acid soon after makes its appearance in abundance, and the urine acquires altogether a more natural color and appearance," &c. Latham states that he has obtained much advantage from a combination of the *carbonate of iron* and opium, in cases of a chronic character, and attended with much debility and nervous irritation. Much of the benefit which results from the use of opium, depends, probably, on its tendency to excite the exhalents of the surface. A diaphoresis, in whatever way it may be produced, rarely fails to check the excessive flow of urine, and this effect is always a considerable advantage, although the urine may remain saccharine. From five to eight grains of Dover's powder may be taken every four hours; or we may give a grain of opium, either by itself or in combination with uva ursi and lime water, two, three, or four times daily. It is of importance, when the patient is put on the use of this narcotic, to keep his system constantly and pretty equally under its influence. Opium may also be advantageously given with lime water. From thirty to forty drops of laudanum, in a gill of lime water, may be given three or four times daily.

The Germans have been much in the habit of giving large doses of *alum* in this affection. Cases are related in which scruple doses of this article were given several times daily with very decided benefit.

Dr. Venables speaks very favorably of the effects of the *phosphate of iron* in this affection. "I have been really struck," he says, "with the efficacy of the phosphate of iron in excessive discharges of urine. The quantity of this secretion is rapidly reduced under the use of this salt, and, indeed, its qualities sensibly altered. The bulimia, also, which attends diabetes, is reduced, and the powers of digestion invigorated and increased. The dose may be gradually increased from a few grains to half a drachm three or four times daily."

Dr. Carter, in his interesting and valuable series of Hospital Reports, has related a case of diabetes, where the disease resisted various modes of treatment,

"until hard work, aided by warm clothing, and a scruple of Dover's powder at night, entirely removed the disease." Dr. Johnson, in remarking on this case, observes, "it is evident that the skin, as an extensive outlet, sympathizing powerfully with almost all the glandular viscera, is an important agent in the removal of this disease. Its agency, therefore, should never be neglected in the treatment of this disease." Dr. Marsh, in his valuable memoir on this disease in the Dublin Hospital Reports, speaks in high terms of the usefulness of exciting the action of the skin in diabetes. For this purpose he directed the same measures which I have just mentioned, as having been successfully employed by Dr. Carter—namely, "hard work, warm clothing, and large doses of Dover's powder." In the case which terminated favorably in my own hands, I united the Dover's powder to uva ursi in doses of fifteen grains each, three times daily. This will generally excite *emesis* for the first two or three days; and the good effects of the remedy appeared to me to be considerably enhanced by the vomiting which it produced. There can exist no doubt that very active exercise or labor, by favoring free exhalation from the surface, will often assist very materially in subduing this disease. Some have recommended the warm bath with the same view, but this remedy has too strong a tendency to relax and debilitate the system, to admit of very frequent application in this affection. Frictions with dry flannel, however, are not subject to the same objection, and they have been resorted to with manifest benefit.

Magnesia has of late years been recommended in England as a remedy of considerable powers in diabetes. Dr. Trotter has published an account of five cases which were effectually treated with this article. He directed his patients to take from one drachm and a half to two drachms of the pure magnesia, in twenty-four hours. The relief obtained, he says, was generally prompt, and attended with no unpleasant consequences. In one instance out of three in which I have prescribed the magnesia, a manifest impression was made on the disease, but the relief obtained was only temporary. I have met with several accounts in the journals since the publication of Dr. Trotter's cases, in which the beneficial effects of this article are set forth in diabetes. I suspect, however, that its usefulness is chiefly confined to that form of urinary disease, in which the urine, though morbidly increased in quantity, is wholly free from any saccharine matter.

Emetics are recommended by Richter, in the treatment of this disease. He has given an account of several cases which were cured by the use of ipecacuanha in doses sufficient to produce active emesis. In one case, he asserts that the disease was removed completely in the course of twenty-four hours. It would seem, however, that these cases were characterized only by an increased discharge of urine, for he nowhere mentions a saccharine urine. Indeed, the custom which prevailed formerly, of including all the urinary affections which are attended with a preternaturally copious discharge of urine, under the head of diabetes, throws no small degree of ambiguity and uncertainty over the recorded experience of the practitioners of the preceding ages.

Among the remedies which have been employed with success in this malady, the *carbonate of ammonia* deserves respectful mention. Dr. Neumen, of Berlin, has given an account of a case which yielded to the use of this remedy, continued for about four months. The dose was gradually increased from five grains thrice daily to fifty grains in the day. I have heard of two other instances in which benefit was obtained from this article, though both cases finally terminated fatally. Alkaline remedies have indeed been very frequently employed in the treatment of diabetes. Lime water, especially, was at one time much resorted to in this disease. Ferriar seems to have placed considerable reliance on it, since we find it mentioned in every case which he has reported. I have myself used it in three or four cases, in conjunction with uva ursi, but I did not perceive that any advantage arose from its exhibition.

Rollo thought very favorably of the powers of the *ammonium sulphuretum*,

or hepatized ammonia, which he rarely failed giving, in conjunction with the more important measure of an exclusive animal diet. In some instances he administered the kali sulphuretum to the extent of from one to two drachms daily, for several weeks.

The application of an epispastic over the sacrum, or the region of the kidneys, has been thought a very useful auxiliary in the cure of this disease. Rollo, Frank, and Marryat, speak favorably of this practice; and I am inclined to think that it deserves attention. In the case which terminated favorably under my care, two large epispastics were applied on the inside of the thighs; as, however, several other active means were used at the same time, it is impossible to say what share this, or indeed any of the other remedial measures, had in the production of the favorable result.

Tonics were formerly much resorted to in the treatment of diabetes; a practice which was founded on the supposed flaccid and debilitated condition of the kidneys and digestive organs. Ferriar gave the cinchona with opium and uva ursi; but the earlier physicians more commonly employed the metallic tonics, more especially iron. Where the system is much relaxed and exhausted, I doubt not at all that the sulphate of quinine may be often very usefully given. If I am not mistaken, Prout advises the employment of this preparation in union with opium. I have heard of an instance in which the administration of three grains of quinine with a grain of alum and the same quantity of ipecacuanha, administered three times daily, produced very excellent effects.

The *mineral acids*, also, are said to have been given with complete success in this affection. Gilby affirms, that out of four cases he cured three with the internal use of the *nitric acid;* and Scott succeeded in one case with the same remedy. Brea, moreover, cured a case of this disease with the nitric acid given internally, together with mercurial frictions over the lumbar region.

Besides the remedies already mentioned, a vast variety of other means are noticed by authors; all of which have been used with more or less advantage, if we are to place any credit in the statements that have been given. Among these may be mentioned the following, as perhaps most entitled to attention: viz., alum;* spir. turpentine; tinctura ferri muriatis; flor. zinci.; cuprum ammoniacum;† mercury;‡ digitalis; the internal use of cantharides;§ valerian; assafœtida; catechu; kino; camphor; myrrh; phosphoric acid; phosphate of soda; phosphate of iron.

I have hitherto said nothing concerning the dietetic means for treating this disease, which, after all, are perhaps the most important and indispensable to success. Rollo was the first who adopted fully the plan of restricting diabetic patients to on exclusive animal diet, with the view of keeping out of the circulation, as much as possible, the saccharine principles which vegetable substances alone afford. When we recur to what has been stated above concerning the close chemical analogy between urea and sugar; the former being little else than a duplication of the constituent parts of the latter, with the addition of a large proportion of *azote;* it would seem that in diabetes there is a great deficiency of azote in the blood, in consequence of which the kidneys cannot form *urea;* but, instead of it, secrete the saccharine matter which characterizes the disease. Now, as animal substances, especially the muscular parts, contain a large proportion of azote, whilst vegetables contain little or none of it, it appears probable that the benefits which result from the former kind of food, arise from the abundant azote which it furnishes to the system, by which the kidneys are enabled to secrete urea instead of saccharine matter. This accords with the gradual changes which occur in the urine in the progress of amendment; for in proportion as the quantity of sugar decreases, that of the urea increases.

* Selle, Beitr. zur Natur. und Arzneiwiss., bd. i.
† P. Frank, De Curand. Homin. Morb., p. 65.
‡ J. Frank, Ratio Instit. Clinic. Ticinem., p. 208.
§ Brisbane, Select Cases, &c., Stœller, Hufeland's Journal, bd. vi.

Whatever may be thought of these speculative views, it is very generally admitted, that an exclusive animal diet constitutes decidedly one of our most efficient means for curing this disease. It is true, that within a few years, Dr. Starky, physician of the Cork General Dispensary, has adduced some facts which would seem to show, that contrary to the common opinion, vegetable substances, or such as contain sugar, will sometimes prove more beneficial than animal food. He states that he has cured several cases of this disease with a vegetable diet, and a drachm of phosphate of soda three times daily. Dr. Johnson also seems inclined to place some reliance on the occasional usefulness of a vegetable diet in this affection. Were these cases attended with a saccharine urine? I am much inclined to believe that this fact is not always inquired into; physicians being satisfied that they have a case of diabetes before them, when they find the patient suffering great thirst, ravenous appetite, and an enormous discharge of urine. All these symptoms may, however, exist, without the disease being diabetes—at least diabetes of the kind we are now considering. I shall presently have to describe a variety of this disease, in which there is an excess of *urea*, and in cases of this kind, a vegetable diet is decidedly indicated, and useful. It is this latter disease, perhaps, which Dr. Starky treated; and if so, we need not wonder that a vegetable diet was found so useful. The observances to be attended to, in the regulation of the diet for a patient affected with this disease, may be summed up as follows:

Fresh bread and potates should be avoided; but the patient may use moderate portions of pilot bread and biscuit. It is of great importance that the quantity of food taken at each meal should not be more than the stomach can readily digest. Roasted or boiled beef, beet-steak, mutton, lamb, and game, should form the principal part of the food; and it is said that fat meats are, in general, more beneficial than the lean parts. For drink, the patient may use water, alum whey, weak brandy and water, milk and water, and beef or chicken.

Sect. II.—*Diabetes Insipidus.*

I proceed now to the consideration of those urinary diseases in which the inordinate secretion by the kidneys is attended with an excess of one or more of the regular ingredients of healthy urine. These affections bear so close a resemblance to diabetes mellitus, that up to the time of Willis they were comprehended, indiscriminately, under the single term diabetes. Collectively, they constitute the disease which has, since the time of this writer, been denominated *diabetes insipidus;* but as they are characterized by a very different condition of the urine, it is more consistent with scientific accuracy to treat of them, as Prout has done, under their several appropriate heads.

In one variety of these urinary affections, the characteristic state of the urine *consists in an excess of urea*, with an augmentation of its quantity, often not inferior to that which occurs in saccharine matter in diabetes mellitus. Bostock has given a particular account of a case of this kind, in the third volume of the Medico-Chirurgical Transactions, with an analysis of the urine, from which it appears that the patient discharged, on an average, twenty pints daily, containing seven and a half ounces of urea, without a particle of sugar. But no writer has investigated this disease so minutely, and described its course and phenomena so accurately, as Dr. Prout, in his highly valuable work on the diseases of the urinary organs. In this affection, there is almost invariably a very frequent and distressing desire to pass urine, both by day and night. In some instances, though exceedingly seldom, the quantity of urine is not much increased. In a great majority of cases, copious diuresis is a prominent symptom. "The quantity of urine, (says Prout,) appears to be particularly liable to be increased by cold weather, and by all causes producing mental agitation. In some instances the patient experiences a considerable sense of uneasiness or aching pain in the loins,

and along the course of the ureters, and there is occasionally a good deal of irritation at the neck of the bladder, extending along the urethra." The skin generally retains its regular functions, being often moist, with general diaphoresis, even when the urinary affection is exceedingly aggravated. The desire for food and drink also, is not morbidly urgent, except in very violent cases; nor are the stomach and bowels often particularly deranged—the tongue being generally clean, and the alvine discharges regular, both in time and appearance. It would appear from the observations of Prout and others, that persons of a thin and spare habit of body, "with a sort of hollow-eyed anxiety or expression in their countenance," are the most liable to this complaint.

With respect to the causes of this form of urinary disease, little is known of a definite character. Prout observes that whatever debilitates the system, and particularly the urinary organs, may give rise to the complaint.

There is another variety of urinary disease, in which the presence of a large portion of albuminous matter in the urine is the characteristic symptom.* This is the variety which has probably been most commonly described under the name of diabetes insipidus; for along with its albuminous principle, the urine is *always* greatly increased in quantity. There are two varieties of albuminous matter occurring in the urine—namely, the chylous and the serous. The first, according to the observations of Prout, occurs most frequently; "it may, however, be remarked, (says this writer,) that strongly defined instances of either variety are not very common, and that by far the most frequent form which the disease assumes, seems to be of an intermediate character; that is to say, the albuminous matters partake in some degree of the properties of both those of chyle and serum; though generally more of those of the chyle."

A morbidly copious discharge of chylous urine was known and described by the ancients as a variety of diabetes. Celsus divides too great a profusion of urine into thin and thick; the former kind, he says, though most frequent, is less dangerous than the latter variety, in which a great quantity of urine is discharged, together with chyle or milk, and the body consequently rapidly deprived of its nutrient principles. Some writers deny that the chyle ever passes off with the urine, as has been stated. They assert, that where the urine has exhibited a milky color, it must have arisen from pus formed in the kidneys, and intimately mingled with the urine in its passage down the ureters to the bladder. That this is a mistaken opinion, is satisfactorily attested by some of the most observant physicians of both ancient and modern times. The appearance of chyle in the urine has been noticed even in apparently healthy subjects. Van Swieten, in his Commentaries, says, "that he has seen in himself some hours after a meal, and especially after hard walking, his urine turbid and milky at the moment that it was evacuated;" and he adds, that he had afterwards observed the same kind of urine in others. Galen also seems to have noticed this chylous state of the urine. (*De Aliment. Facult.*, lib. i. c. 2.) But the authority of Prout is alone sufficient to establish the opinion that the milky appearance of the urine, in cases of this kind depends solely upon the presence of unchanged chyle. When, along with the chyle, there is a large portion of albuminous matter in the urine, this fluid undergoes a spontaneous coagulation, assuming the appearance nearly of *blanc mange*. Mr. Elliotson, in his edition of *Blumenbach's Physiology*, relates a remarkable instance of chylous urine. This case occurred in a young

* [This subject has been carefully investigated by Dr. Bright, of London, and so much importance has been attached to it in consequence as to induce the fabrication of a new term in nosology, viz., "*morbus Brightii*."—Of late the same condition has been denominated by the European journalists, "*albuminuria*." The only practical result which has been derived from these inquiries is, that when the urine exhibits coagulable matter under the influence of heat, just below the boiling point, an inflammatory condition of the kidneys may be suspected, which should be assailed by the appropriate antiphlogistic remedies. The granulated appearance of the kidney described by Dr. Bright, is by no means essential to the pathology of this affection.—Mc.]

married woman. In the morning, the coagulum of chyle in the urine was pale, with pink streaks; in the evening it was white. After fasting for twenty-four hours, the coagulum "was extremely pale, with pink streaks." This kind of urine is extremely prone to decomposition, becoming speedily very offensive to the smell. In some instances, says Prout, the urine, on standing awhile, "throws up a sort of creamy matter upon its surface."

The general symptoms which accompany this affection, after it has continued long, and is violent, do not differ materially from those that attend diabetes mellitus. In violent cases, the thirst becomes very tormenting, the appetite craving, and the skin dry and harsh, with progressive emaciation. In less aggravated cases, the constitutional symptoms are generally mild, and in some instances scarcely perceptible. The patient, however, generally complains of some degree of uneasy feeling in the præcordium, and a sensation of languor and feebleness in the muscles of the loins. I have seen two cases in relaxed, debilitated, and emaciated females, in which the urine seemed to consist almost wholly of albuminous matter, mixed with a small portion of chyle. In both these cases, the urine changed to a jelly-like mass after standing an hour or two. Prout has given an account of a similar case. "The first specimen of urine, voided in the morning," he says, "consisted of a solid jelly-like mass or coagulum, of a pale amber color." The second specimen, voided after breakfast, resembled the first in its general character, but exhibited a whey or slightly milky color. The third specimen, voided in the evening, after an early dinner, was the most remarkable, and so closely resembled chyle in all respects, that it could scarcely be distinguished from this fluid.

Causes.—No age, it seems, is wholly exempt from the formation of chylous urine, although it occurs most commonly after the middle period of life; and in persons of an irritable habit of body, and impaired digestive powers from a previous course of free indulgence in the pleasures of the table, and in spirituous drinks. The exciting causes appear to be such, chiefly, as have a tendency to weaken and irritate the kidneys. Violent passions of the mind, and protracted courses of mercurial remedies, are also accounted among the ordinary exciting causes of this disease.

Prognosis.—This complaint is not attended with much danger, and in its milder form may continue for many years without producing any very serious consequences. In the more aggravated cases of chylous urine, however, a great degree of languor and emaciation sooner or later ensues; and life is ultimately destroyed, either by the supervention of hectic, or a gradual and total exhaustion of the vital powers. One of the above named cases, that came under my notice, terminated in phthisis pulmonalis.

The last variety of urinary disease I have to mention is that in which there occurs *an excess of the earthy phosphates in the urine.* This affection is by far more common and distressing in its consequences than either of the two preceding urinary complaints. Prout is, I believe, the first writer who has given a definite and circumstantial account of the phenomena and character of the urinary affections, characterized by a deposition of earthy phosphates. A preternatural copiousness of urine forms, in general, a conspicuous circumstance in this variety of the disease. In some instances, indeed, the quantity discharged is not inferior to that which occurs in the most perfect cases of diabetes. The urine is invariably pale-colored; and in many instances, it is perfectly colorless and pellucid.

When this is the case, the quantity discharged is always very profuse, and it deposits no sediment on being left to cool. Occasionally it happens that the quantity of urine is not much greater than natural; and in this case, it is usually somewhat opaque, and deposits a very copious pale-colored sediment after standing awhile. In none of the kindred affections, already considered, does the urine manifest so great a tendency to decomposition as in the present complaint. In a very few hours after being voided, it becomes alkaline, and emits an extremely pungent and disagreeable smell. Connected with these morbid conditions of the

urine, there always exists very great irritability of the general system, and an obvious derangement of the digestive functions. The patient is tormented with flatulency, nausea, costiveness, or diarrhœa; attended with a sense of weight and oppression after taking food; and variable and capricious appetite. "The stools are extremely unnatural, being either nearly black or clay-colored, or sometimes like yeast. These are always accompanied by more or less of a sensation of pain, uneasiness, or weakness in the back and loins. There is a sallow, haggard expression of the countenance; and as the disease proceeds, symptoms somewhat analogous to those of diabetes begin to appear—such as great languor, depression of spirits, coldness of the legs, complete anaphrodisia, and other symptoms capable of extreme debility." (Prout.)

Prout, to whom I am indebted for the foregoing description of this affection, asserts, that "a large portion of the cases which have come under his own observation, were distinctly traced to *some local injury of the back*—such as a fall from a horse," &c. Among the general causes, he enumerates protracted depressing passions; excessive fatigue. The most common local causes, besides the one already mentioned, are some irritation about the bladder, or urethra, especially when of a chronic character—"such as a foreign substance introduced into the bladder, including all sorts of calculi; the retaining of a bougie or catheter in the urethra; strictures of the urethra in particular constitutions;" and disease of the prostate gland.

When injury of the spine is the exciting cause of the disease, the prognosis may, in general, be regarded as unfavorable. Prout observes, that this affection "very rarely gives origin to calculus in the kidneys."

Treatment for diuresis with excess of urea.—Experience has shown that tonics, in union with opium and alkalies, constitute the most useful remedies in this variety of the disease. From one to two grains of quinine, with from twenty to thirty grains of the bicarbonate of soda, may be given three times daily, and an opiate administered in the evening. Much advantage may also be obtained from alterative doses of mercury. Three or four grains of blue pill, with one or two grains of ipecacuanha, should be given every other evening, or smaller doses may be given every evening. Gentle purgatives, too, are useful in this variety of the complaint. A mixture of magnesia and rhubarb will, in general, answer better than any other aperient in cases of this kind. The diet should be simple, unirritating, and digestible; and all kinds of stimulating drinks must be avoided. Some benefit will occasionally result from the use of limewater and milk, in conjunction with the remedies just mentioned; but the principal object should be to establish the healthy action of the liver and digestive organs.

In *diuresis attended with an excess of phosphatic salts* in the urine, *opium*, according to the experience of Dr. Prout, is decidedly the best remedy we possess. The great object, in this variety of the disease, is to allay the general irritability which is so prominent a symptom in this affection. Where opium is objected to by the patient, we may resort to the use of hyoscyamus, in union with uva ursi, with considerable advantage. Two or three grains of the extract of hyoscyamus, with from twenty to thirty grains of pulverized uva ursi, should be given twice or three times daily, according to the urgency of the symptoms. I have, in several instances of this disease, employed the following pills with a most excellent effect.* Mr. Prout mentions a strong infusion of the *alchemilla arvensis* as a very useful remedy for the purpose of allaying the irritability of the bladder. When the irritability of the system is in some degree moderated by the narcotics just mentioned, tonics are more particularly proper—and of this class of remedies, the mineral acids, in conjunction with cinchona or quinine, are decidedly the most valuable in this affection. The nitric, or nitro-muriatic

* ℞.—Extract. hyoscyam.
Pulv. camph, āā ʒss.
Mucilag. g. Arab. q. s.—M. Divide into thirty pills. S. Take one four times daily.

acid, diluted in water, should be freely administered, and continued until the character of the urinary deposit is changed. When the mineral acids are disagreeable to the stomach, the citric acid may be employed; but this latter is not, in general, equal to the nitric, or nitro-muriatic acids. From one to two drachms of these acids, diluted in a sufficient quantity of water, may be taken daily. The diluted acid should be sucked through a glass tube or quill, to prevent the teeth from being injured. Ten grains of the extract of hyoscyamus may be dissolved in a pint of water, to which a drachm of the nitric acid is to be added, and which may be used in divided doses during the day. At the same time that acids are employed, it will be proper to keep down the general and local irritability by the use of opium or hyoscyamus; and after the phosphatic condition of the urine has been, in a great measure, removed, by the use of the acids, quinine and iron, in full doses, constitute the principal remedies. Dr. Venables strongly recommends the use of the phosphate of iron in this affection. He asserts, that it seldom fails to lessen the quantity of urine discharged.

Some benefit may also be obtained from local applications of a stimulating character to the loins—such as plasters of Burgundy pitch, galbanum, turpentine, or stimulating embrocations.

Active purgatives are injurious. Prout states that he has known the most serious consequences brought on by a small dose of calomel, which, by inducing diarrhœa, and consequent debility, aggravated all the symptoms. Nevertheless, costiveness is almost equally injurious, and particular care should be taken to keep up a regular action of the bowels. This may, in general, be accomplished by the use of two or three Seidlitz powders, or small doses of castor oil, without the risk of inducing frequent and debilitating stools. Prout says, that mercury, in all its forms, is calculated to do much harm; and all alkaline remedies must be rigidly avoided.

The diet should be mild and nutritious. In general, the lean parts of tender meats afford the best food for patients affected with this variety of urinary disease. In some instances, however, a diet of this kind, from the very irritable state of the general system, renders the patient very uncomfortable during the period of digestion. In such cases, farinaceous, and particularly acescent vegetable articles of food, will usually answer very well.

Sect. III.—*Lithiasis.*

There is no subject in pathology which has of late years been more patiently and minutely investigated, than the secretion of sabulous matter with the urine, and its formation into calculous concretions. The latest and best works on this subject, are those of Dr. Marcet, Mr. Brande, and Dr. Prout; and it is to the excellent treatise of the latter that I am chiefly indebted for the following facts and observations.

Urinary deposits.—There are three forms of urinary depositions, namely:

1. *Pulverulent sediments*—appearing on the sides and bottom of the vessels in which the urine is *left to cool*, in the form of a very fine sedimentous powder. These pulverulent depositions are usually of a red color, inclining sometimes to a brown, and at others to a yellow hue. In a general way, they may be stated to consist of two classes of calculous matter—namely, the *lithates* of soda, ammonia, and lime, constituting what are usually called *lateritious* or *pink* sediments; and the *phosphates* of lime, magnesia, and ammonia, constituting the *white* sediments. These sediments exist in a state of *solution* in the urine, and are deposited only when it cools, or an acid is added.

2. *Crystallized sediments*, called gravel or sand, consisting of minute, irregular grains, *suspended*, not dissolved, in the urine; and of course sink to the bottom of the vessel almost as soon as the urine is voided. They consist of *lithic acid* nearly in a pure state; or of a *triple combination of phosphoric acid*,

magnesia, and ammonia; or finally, of *oxalate of lime.* The first are red, the second white, and the third of a dark blackish-green color. These different varieties of *gravel* are never voided together in the same urine, though in the pulverulent state the two former often occur in union with each other.

3. *Solid concretions.*—These result from the gradual agglomeration of the two former varieties—forming what are termed urinary calculi. Of these concrete masses, Prout mentions thirteen varieties; but a description of these does not properly come within the scope of the present work, the *general* pathology and remedial management of the different lithic diatheses being the objects to which the attention of the physician is more particularly called.

In relation to the comparative frequency of the different varieties of urinary deposits, it appears from the data collected by Dr. Prout, that the *lithic acid* predominates in more than one-third of the whole number of urinary calculi; and it has, moreover, been ascertained, that lithic acid very generally constitutes the central nucleus, even in the other varieties of calculi. It would seem, therefore, that the deposition of lithic acid must be considered as the primary process in the formation of urinary calculi; and that the *phosphate* and *oxalate* formations are the result of a gradual transition from the lithic acid to the phosphatic or oxalic diathesis. In the progress of this transition, the lithic acid deposition is in the first place changed into the *lithate of ammonia*, with a loss of the tinge derived from the coloring principle of the urine. After some time, this latter gives place to the deposition of sediment, composed chiefly of carbonate and phosphate of lime, and this is finally succeeded by the phosphates of lime and magnesia, in combination with ammonia. It is a curious circumstance in the pathology of lithiasis, that although the deposition of lithic acids or its compounds is very frequently followed by the phosphatic and earthy deposits, "yet it may be laid down as a general law, that in urinary calculi, *a decided deposition of the mixed phosphates is never followed by other depositions.*"

Notwithstanding the various forms and appearances which urinary calculi present, they may be classed under four heads, according as one or the other of the following elementary substances predominates; namely, 1, the lithic acid and its compounds; 2, the oxalate of lime; 3, the cystic oxide; and 4, the earthy phosphates. The abnormal conditions of the system which give rise to the secretion of these lithic substances, are with propriety distinguished as peculiar *diatheses;* and we accordingly have the *lithic acid diathesis*—the *phosphatic diathesis*—the *cystic oxide diathesis*—and the *oxalate of lime diathesis*, as the four cardinal points of attention in the pathology of lithiasis.

1. *Lithic Acid Diathesis.*

The urinary sediments which belong to this diathesis, are either pulverulent or crystallized. When the former is the case, they consist of some combination of this acid with an alkaline basis, generally ammonia; but when the deposit is crystalline, it consists *nearly of pure lithic acid.*

These *amorphous* sediments may be classed under three heads, corresponding to the color which they possess, namely, the *yellow*, the *red* or *lateritious*, and the *pink* sediments.

The *yellow depositions*, varying from almost a white to a brown color, consist of the lithate of ammonia tinged by the coloring matter of the urine. These are the sediments which occur in the urine of healthy, or slightly dyspeptic individuals; but when they occur in abundance, they indicate a tendency to *an excess of lithic acid and its consequence.* Children are most subject to the yellow lithates in the urine.

The *red* or *lateritious*, varying from nearly a white to a deep brick-red color, consists, like the former variety, of the lithate of ammonia, and sometimes of lithate of soda; deriving their red color partly from the *purpurates* of soda and ammonia, and the coloring matter of the urine. The presence of the *red* color

of these depositions, or rather of the purpurates upon which this color depends, may be regarded as a certain indication of a febrile or inflammatory condition of the system. To this, says Dr. Prout, "I have never seen a decided exception." In general, the deeper the color or redness of the sediment, the more decidedly phlogistic is the condition of the system.

The *pink sediments* are much less common than the other two amorphous sediments belonging to this diathesis. "Like the other two varieties, they consist essentially of the lithate of ammonia," but they derive their color exclusively from the purpurate of ammonia. The pink sediments are most apt to occur in chronic visceral inflammation, particularly hepatitis; and we frequently meet with it in dropsy, hectic fever, and in the more aggravated forms of dyspepsia. The sediments which occur in the sweating stage of remitting and intermitting fever, and during the favorable crisis of gout, rheumatism, and other febrile affections, are of the lithic acid kind. Prout says, that in three instances he has seen a perfectly *white* lithate of soda deposited in the urine.

Of the causes which favor the excessive secretion of lithic acid, or its compounds.—The circumstances which tend to produce a redundancy of lithic acid sediment in the urine, independently of general local inflammatory and febrile affections, are:

a. Errors in diet.—The mere *excess* of wholesome food; heavy, indigestible, irritating, or unwholesome articles of diet; taking full meals at unusual hours; in short, whatever resists or deranges the digestive powers, will produce or increase the deposition of the lithate of ammonia. Prout says, that, according to his observations, the articles most apt to give rise to this urinary deposit, "are animal substances, and more especially heavy unfermented bread, or compact, hard-boiled fat dumplings or puddings."

b. Excessive and unusual corporeal and mental exertions, or want of exercise, are accounted among the exciting causes of the lithic depositions in the urine.

c. Debilitating circumstances.—Whatever is capable of diminishing the vital energies, has a peculiar tendency to give rise to urinary depositions of this kind. The depressing passions, want of nourishment, great fatigue of body or mind, &c., seldom fail to induce these sediments in the urine.

d. I have already referred to the frequency of the lithic acid sediments, in the urine of persons laboring under fevers of an inflammatory character; and particularly during the critical perspirations which occur in gout, rheumatism, intermitting and hectic fever, and in acute and chronic inflammation of the liver, as well as in various other affections attended with a phlogistic diathesis. In aggravated cases of dyspepsia, these urinary depositions are rarely wholly absent.

With regard to the exciting causes of the crystallized depositions, or the excess of uncombined lithic acid in the urine, different opinions have been expressed by the late writers on this subject. According to Magendie, the excessive secretion of this acid in the urine is very particularly favored by articles of food that contain an abundance of *azote*, and, therefore, especially by *animal food*. This opinion is predicated on the facts, that azote enters into the composition of lithic acid, and that animals confined to food destitute of azote, produce no lithic acid, whilst those which live almost exclusively on animal food (which contains an abundance of azote) secrete large quantities of pure lithic acid. Notwithstanding these plausible facts, later experiments and observations have afforded abundant evidence, that the formation of this urinary acid is independent of the quantity of azote introduced with the aliment, and that there are numerous other circumstances which favor or oppose its secretion by the kidneys. From a series of experiments performed by Dr. Philip, with the view of elucidating this subject, he draws the following conclusions:

"1. That acid and acescent ingesta tend to increase the deposition of lithic acid from the urine, and to prevent that of the phosphates.

"2. That a diet composed of a large proportion of animal food, tends to lessen the deposition of lithic acid, and to increase that of the phosphates.

"3. That everything which promotes the action of the skin, tends to prevent the deposition of lithic acid, and to occasion that of the phosphates.

"4. That dyspepsia tends to increase the deposition of lithic acid, and to lessen that of the phosphates, both by producing acidity of the primæ viæ, and by rendering the skin inactive.

"5. That indolence has the same tendency, both by inducing dyspepsia, and by lessening the activity of the skin in proportion as it impairs the vigor of the circulation.

"6. That an acid passes off by insensible as well as sensible perspiration."*

It appears from the observations of Dr. Prout, that certain unknown circumstances, connected with the *age* of the patient, modify, in no inconsiderable degree, the influence of the ordinary causes of an excess of lithic acid in the urine, as well as the constitutional symptoms which attend the active state of this diathesis. Thus, children born of gouty and dyspeptic parents "are exceedingly liable to lithic acid deposits in the urine." Such children are very apt to manifest a frequent desire to pass urine, with very small discharges, and evident pain or uneasiness during and immediately after micturition. If, on examination, the urine is found to be charged with this sediment, immediate means should be used to counteract the diathesis, "as there is much greater risk at this period of life than at any other, of the formation of stone in the bladder."

There seems to be less disposition to form lithic acid deposits between the ages of puberty and forty, than at any other period of life. There is less risk, too, says Prout, of the formation of urinary calculi between the ages just mentioned, than at other periods; for except in cases attended with an extremely copious secretion of this acid, it generally passes off entirely with the urine, in the state of gravel.

Between forty and forty-five years of age, the constitutional habit of body, in most individuals, undergoes a considerable change; and concomitantly with this change the lithic acid diathesis is frequently very strongly developed. Not only do we, in general, find persons who have passed this stage of life secrete much larger quantities of lithic acid, or its compounds, than previously, but there appears to be a manifest disposition in the constitution at this period, "to separate the acid in a concrete state—thus giving origin to the formation of renal caculus," and the consequent train of various distressing secondary symptoms.

The *general symptoms* which usually accompany an excessive secretion of lithic acid, are—pain and uneasiness in the region of the kidneys; a sensation of irritation and heat at the neck of the bladder, and in the urethra; a frequent desire to void urine, "which is passed in small quantities at a time, and without affording the usual relief, the sensation still continuing as if some urine were left behind in the bladder." Dyspeptic symptoms—particularly acidity and flatulency in the *primæ viæ*, are among the most common symptoms of the lithic acid diathesis.

2. *Phosphatic Diathesis.*

The phosphatic deposits from the urine are generally *amorphous*, though occasionally they appear also in a crystallized form. The deposition of the phosphates rarely occurs as an original affection, being almost universally consequent "to the other forms of urinary deposition, and more especially the lithic acid and oxalate of lime.

The *crystallized phosphatic sediments* consist almost universally of the triple phosphate of magnesia and ammonia. In connection with the appearance of this sediment in the urine, which is of a yellowish-white color, the patient generally

* Medical Transact. of the College of Physicians of London, vol. vi. art. 9.

complains of dyspeptic symptoms, *general nervous irritability*, some pain and uneasiness in the loins, lassitude, and want of mental energy. The urine is generally copious and pale, and when suffered to stand awhile, becomes covered with an iridescent pellicle, consisting of minute crystals of the ammoniated phosphate of magnesia. The urine is very apt to enter into the process of decomposition, and to become alkaline and putrescent. Sometimes this crystallized deposit is formed immediately after the urine is voided; but more commonly the crystals do not appear until the urine has become cool, or begins to putrefy.

The *amorphous phosphatic sediments* are always composed of a mixture of phosphate of lime, and the triple phosphate of magnesia and ammonia—the former constituting by far the greater proportion. Some writers of eminence maintain that these sedimentous matters are not separated from the blood by the kidneys, but wholly and exclusively by the inner coat of the bladder, from a peculiarly morbid condition of this structure. Prout admits that the phosphate of lime is sometimes derived, in part, from the mucous membrane of the bladder—but he doubts "if any portion of the triple phosphate is ever derived from this source," the kidneys being, according to his observations, the only source from which it proceeds.

The general symptoms which accompany an habitual and copious deposition of the amorphous phosphates from the urine, are often peculiarly distressing. The general system, both physical and mental, is almost extremely irritable; and great derangement of the digestive organs, manifested by flatulency, nausea, constipation, or exhausting diarrhœa; extremely variable and unnatural stools—being black, or whitish, and sometimes resembling yeast—accompanied with a dull aching pain, and a peculiar feeling of weakness in the loins. The countenance, in aggravated cases, becomes sallow and haggard, "and as the disease proceeds, symptoms somewhat analogous to those of diabetes ensue, such as great languor and depression of spirits, coldness of the legs, complete anaphrodisia, and other symptoms of extreme debility." The urine is pale and often very copious.

With regard to *the causes* of the urinary sediments, composed of phosphates, writers have expressed some difference of opinion. Dr. Marcet and M. Brande maintain that the use of alkaline remedies, when continued for some time, has an especial tendency to give rise to the phosphatic depositions, and this opinion has been particularly acted on in the remedial treatment of urinary disorders of this kind. Dr. Prout, on the contrary, considers this tendency of alkaline remedies as very trifling, and scarcely worth attention, either in an etiological or therapeutic point of view. The occasional causes of the present variety of urinary deposits, are either of a local or general character. Injury of the back, as a blow or a fall, says Dr. Prout, is a very common source of this affection; and its occurrence is also particularly promoted by excessive fatigue, and the protracted influence of debilitating mental emotions. *Irritations about the neck of the bladder or urethra*, from whatever source they may proceed, particularly when operating for a considerable length of time, have an especial tendency to give rise to the secretion of phosphatic sediments, and hence the presence of a small uric calculus in the bladder very frequently becomes surrounded by a mass of urinary phosphates—so as to present the character of a phosphatic calculus externally, whilst its central portion, or nucleus, consists of lithic acid, or of the lithate of ammonia.

Treatment.

Treatment for the lithic acid diathesis.—To counteract the excessive secretion or formation of lithic acid depositions from the urine, our principal aim must be to establish the healthy action of the digestive organs. For this purpose, we must, in the first place, adopt proper dietetic regulations; for without an especial attention to this point, little or no benefit will be derived from any remedial measures. The patient must be put on a plain, digestible, and nourishing diet, and be particularly cautioned against taking very full meals. "An error in *quantity* is

infinitely more important," says Dr. Prout, "than an error in *quality* of the diet." Indigestible, mixed, and irritating articles of food, particularly fresh and unfermented bread, solid farinaceous preparations, salted and dried meats, and *all kinds of acid drinks and acescent aliment* must be carefully avoided.

At the same time that attention is paid to the diet, it will be proper to use means for correcting the secretion of the liver and alimentary canal, and for keeping up a regular action of the bowels. With this view, mild aperients, followed by alkaline medicines, in union with weak infusions of some of the usual bitter vegetable tonics, are particularly beneficial. One of the following pills may be taken every second or third evening, until the hepatic and intestinal functions are restored to a healthy condition.* If they do not procure one or two full evacuations on the following morning, a small dose of magnesia, or one or two Seidlitz powders, may be taken to promote their operation. The regular use of *alkaline* remedies is an important measure in the remedial management of this diathesis. From fifteen to twenty grains of magnesia, taken in a glass of soda water, will often answer this purpose very well. The *sal æratus*, (potassæ ærata,) too, is an excellent alkaline in such cases.† From one to two drachms, dissolved in a few ounces of a very weak infusion of colomba or gentian root, may be taken once or twice daily. Twenty or thirty drops of the liquor potassæ may also be employed.

It appears from the experiments and observations of Dr. Philip, that the regular action of the cutaneous exhalents tends very considerably to lessen the deposition of lithic acid from the urine: and he observes, that the lithic acid is much more effectually thrown off by the cutaneous exhalents, when merely the insensible exhalation is augmented, than when the sensible perspiration is increased. The action of the skin should therefore be duly supported by regular exercise, the occasional use of the warm bath, small doses of the pulvis antimonialis or tartar emetic, and the wearing of flannel next the skin.‡ Prout says, that warm sea-bathing is sometimes "particularly beneficial, though occasionally the gravelly deposit seems to be increased under its use;" which latter circumstance he ascribes "to the use of the hard waters that generally prevail along the coast;" for the use of such water is especially injurious in the lithic acid diathesis.

In cases accompanied with a general irritable state of the system, or with much irritation in the urinary organs, narcotics should be used—particularly opium and hyoscyamus. Although a regular action, and even a moderate degree of looseness of the bowels, are very desirable in the management of this affection, yet care should be taken not to employ very active purgatives. About the age of forty, a particular tendency is apt to occur to rid the system of the cause of constitutional irritation in this diathesis, in consequence of which the kidneys secrete an unusual quantity of lithic acid, "and by this process gives great relief to the system at large." It is thus that diuretics are often highly serviceable at this period of life; which, favoring the secretion of large quantities of lithic acid,

* ℞.—Mass. pil. hydrarg. ʒi.
G. aloet. Soc. gr. xvi.
Tart. antimon. gr. iss.—M. Divide into 16 pills.—Or,
℞.—Calomel gr. iv.
Pulv. antimonialis gr. vi.
Extract. colocynth. compos. gr. vi.
Extract. hyoscyam. gr. iii.—Divide into 4 pills. Take one at bedtime, twice or thrice a week; and followed the next morning by an active dose of the sulphate of magnesia.

† This preparation is made by dissolving half a pound of the subcarbonate of potass in ten ounces of water, adding two ounces of subcarbonate of ammonia: after it has effervesced, it is crystallized.

‡ Dr. Philip observes, that "the effects of Dover's powder on the urine are transitory, apparently ceasing as soon as the sweat ceases to flow. But those of the tartrate of antimony may generally be perceived for several days after it is taken, during which it still seems to lessen the tendency of the urine to deposit lithic acid. I have also repeatedly observed, that the deposition of lithic acid was not so effectually prevented by tartrate of antimony when it produced nausea, as when no sensible effect was experienced from it."—*Loc. cit.*, p. 202.

and thus causing a kind of artificial crisis—frequently give great relief to the constitution. Prout says, that muriatic acid, in union with opium, will often answer very well for this purpose; and Dr. Henry has known a combination of turpentine and laudanum to "bring away several ounces of lithic acid in the course of a day or two." For this purpose we may also have recourse to various vegetable diuretics with occasional benefit;—particularly the infusion of *monarda punctata*; of *erigeron heterophyllum*; *alchemilla arvensis*; *sem. daucus carota*, and of *galium aparine*. When the kidneys are in a state of high irritation or inflammatory excitement, these diuretics must be employed with great caution; it would seem, also, that they are "not adapted to any other species of deposit than crystalized lithic—nor even to this form of the disease, when it occurs in very young or very old subjects."

In what is usually called *a fit of the gravel*—an affection which "consists in the secretion of a large portion of lithic acid by the kidneys," preceded, as well as accompanied, usually, by general constitutional irritation and febrile movements—the treatment does not differ materially from that which has already been described, "except that it must be more active." Thus venesection, cupping, or leeching from the region of the kidneys, and active mercurial purges with antimonial powder, ought to be efficiently employed *before* diuretic remedies are prescribed. The warm bath, or warm fomentations applied to the loins, in conjunction with the less stimulating diuretics just mentioned, with the addition of colchicum, will seldom fail to procure considerable relief. A strict antiphlogistic regimen is indispensable, and after the attack is over, the patient should adhere strictly to the dietetic rules mentioned for counteracting the lithic diathesis.

Treatment proper in the phosphatic diathesis.—It was before stated, that a peculiarly irritable state of the system is one of the most constant, and in general the most distressing circumstance attending the completely developed form of the *phosphatic diathesis*. An important indication, therefore, is to diminish this unnatural irritability, and to restore the general health of the system, at the same time that measures are adopted to correct the morbid condition of the urinary organs. *Opium*, according to the experience of Dr. Prout, is the only beneficial remedy for allaying the morbid irritability of the constitution; and it should be given in large and repeated doses—from one to five grains three times daily, according to the urgency of the symptoms. After the irritable state of the system has been, in some degree, reduced by the use of this narcotic, recourse should be had to tonics—particularly to the mineral acids, cinchona, the ferruginous preparations, uva ursi, &c. The acids are not only beneficial by their general tonic influence, but they tend, also, in a direct manner, to lessen the alkaline character of the urine.* Where the mineral acids disagree with the stomach, the citric acid should be used.

Local applications to the region of the kidneys—such as a large pitch, soap, or galbanum plaster; and in very severe cases, setons or issues in the back, will often assist considerably in mitigating the violence of the symptoms. Active purgatives are apt to prove injurious: and those *saline* purgatives that contain a vegetable acid, are said to be particularly improper in this affection. "Mercury in all its forms, especially when pushed so far as to produce its specific effects on the constitution, seems capable of doing a great deal of mischief." If small alterative doses of this medicine are indicated, they should be given in union with opium. All alkaline remedies must be strictly avoided, and diuretics of every kind are almost equally improper in the phosphatic diathesis. Hard waters, used as drink, "are literally poison in this form of the disease." The drink should be distilled, or the softest water that can be procured.

In moderate cases, where the irritation is chiefly confined to the urinary organs, *hyoscyamus*, in union with *uva ursi*, with an occasional small dose of opium,

* [Of these, the nitric acid, or the nitro-muriatic acid, is to be preferred in all respects. From 20 to 60 drops may be given three times a day largely diluted in gum water.—Mc.]

should be administered. In cases of this kind, I have known much benefit derived from taking from half a pint to a pint of a weak infusion of the *monarda punctata* during the day. Prout speaks very favorably, in the slighter cases of this affection, of the employment of the infusion of *alchemilla arvensis*.

The diet should be digestible, mild, and nourishing—such as the lean parts of the most tender kinds of meat. Some writers direct the use of an acescent vegetable food, but Dr. Prout is inclined to prefer an animal diet. Much, of course, will depend on the state of the stomach in relation to the propriety or impropriety of these different kinds of food. When the irritation of the mucous membrane is great, animal food will be found too stimulating; and, on the other hand, the greater digestibility of this kind of diet renders it decidedly proper where the digestive powers are weak, with an absence of mucous irritation of the stomach.

A tranquil state of the mind has a most important curative influence. "The influence of mental anxiety," says Dr. Prout, "is really astonishing in this disease; and absence from care, the exhilarating air of the country, and such exercises as are consistent with the patient's condition, will, perhaps, more than anything else, contribute to the cure, particularly in the slighter cases, and when the cause is not local injury."

Sect. IV.—*Ischuria Renalis.*

Suppression of urine is always a very formidable affection, whether it occurs as an idiopathic malady or secondarily in the course of other diseases. This affection must not be confounded with mere *retention of the urine*. In ischuria, the functions of the kidneys are more or less suspended or destroyed, the secretion of urine being either morbidly diminished, or entirely suppressed. In *retention* of the urine, on the other hand, the urine is regularly secreted by the kidneys, and conveyed to the bladder; but from some cause or other, an inability to evacuate it occurs, and being thus retained, it gradually accumulates, until, in some instances, the most distressing, and even fatal consequences occur.

Ischuria renalis may be partial or complete. In the former case, very small portions of urine are, from time to time, discharged from the bladder, under symptoms often extremely distressing. The patient is harassed with a very frequent desire to pass off the urine, accompanied with more or less uneasiness or pain, and a sense of dull, heavy weight in the iliac region, and in some cases much pain and tenderness throughout the whole lower part of the abdomen, together with great anxiety of feeling, nausea, or vomiting, and occasionally hiccup. In almost all instances of urinary suppression, febrile symptoms are conspicuously present. The thirst is usually urgent, and where the suppression is complete, and continues for some time, patients often experience a distinct urinous taste in the mouth; and the whole surface of the body, in instances of an obstinate character, exhales a very perceptible urinous smell. In cases attended with the foregoing symptoms, the suppression is, probably, always the consequence of high irritation or inflammatory action in the kidneys. Suppression of urine is not, however, always attended with the painful symptoms just mentioned. In some cases the patient experiences neither pain, nor weight, nor any particular uneasiness in the region of the kidneys and bladder. Sir Henry Halford has related five instances of this kind.* Cases of this kind would seem to depend on total *paralysis* of the kidneys. Whatever may be the immediate cause of the suppression, or with whatever phenomena it may be accompanied in its early stage, symptoms of cerebral oppression never fail to ensue, if the disease continues for two or three days, and often in the course of thirty hours, if the urinary secretion is not in some degree restored. Indeed, one of the most singular circum-

* On the Necessity of Caution in the Estimation of Symptoms in the last Stage of some Diseases.

stances attending this disease, is the inevitable tendency to *coma and effusion in the brain.* In complete suppression, depending on paralysis of the kidneys, where little or no uneasiness is experienced in the abdomen or urinary organ, the patient, in the course of the second or beginning of the third day, begins gradually to sink into coma, and finally dies in a state of complete stupefaction. Mr. Abercrombie, in an interesting paper on this affection, has related five cases, all of which terminated in this way.* Where inflammatory action of the kidneys is the proximate cause of the suppression, the coma is frequently preceded by delirium, and convulsions sometimes finally ensue.

I have already adverted to the strong urinous smell of the perspiration which occurs in the latter periods of this complaint,† and it appears, from various cases that have been published, that a vicarious secretion of urine sometimes, though indeed very rarely, takes place from particular organs or parts—more especially from the umbilicus. Dr. Hastings has related a most interesting case of ischuria renalis, in which, many days after the commencement of the disease, considerable quantities of urine were discharged from the umbilicus, for three days in succession.‡ Dr. Hastings refers to some of the older writers for accounts of similar cases. Schenck relates two instances of this kind;§ and a case is recorded by Sennertus, as having occurred under the observation of the celebrated Platerus, in which, in consequence of a total inactivity of the kidneys, an urinous fluid was copiously discharged from the right ear.‖ Instances of this complaint are on record, also, in which a fluid resembling urine was copiously discharged by vomiting, and by stool. Valisneri has given an account of a case of ischuria, in which copious discharges of a urinous fluid occurred from the stomach. Water is always found more or less abundantly effused into the cavities of the brain, and has, in general, a very perceptible urinous smell.¶

Causes.—The immediate cause of suppression of urine may be either *inflammation*, or paralysis of the kidneys, or mechanical obstruction. Nephritis is always attended with a greater or less suppression of the urinary secretion; but as both kidneys are very rarely inflamed at the same time, there is, in general, a sufficient quantity of this excrementitious fluid separated from the blood, by the sound kidney, to obviate any particular danger from this source. Of course, whatever is capable of causing much irritation, or inflammation of the renal organs, may become the remote cause of this affection. Schenck relates a fatal case, which was caused by a blow on the loins; and on post-mortem examination, a considerable abscess was discovered between the muscles contiguous to the kidneys. Lælius à Fonte has recorded a case, in which the left kidney was gangrenous; and in several cases related by Hildanus and Bonetus, the kidneys

* Edinb. Med. and Surg. Journal, April 1821.

† Dr. Yeates (*Med. and Phys. Journ.*, No. 29) relates instances of ischuria, in which the secretion of a urinous fluid by the skin was noticed; and Sauvages mentions a case in which this phenomenon was distinctly observed.

‡ Midland Medical Reporter, No. 4.

§ One of these cases was in a female. "Cum suppressa per multas dies fuisset urina tandem per umbilicum urinam profluit."—*Obs.*, lib. iii. *de Urina*, p. 489, as quoted by Hastings.

‖ Puellæ cuidam annos natæ tredecim cùm aliquando copiose minxisset, urinam subito suppressam esse atque tunc aquam serosam ex aura dextra adeo affatim cœpisset effluere, ut una vice duæ sæpe emanarint idque dies aliquot.—*Sennerti, Opera*, lib. iii. p. viii. s. ii. cap. ix.—Hastings.

¶ Several very extraordinary instances of long-continued suppression of urine have recently been reported. In Hufeland's Journal for August 1827, there is a case related of a lady, who made no water for seven weeks. There was no vicarious secretion of urine. "In another German Journal there is a case reported, in which the secretion of urine by the kidneys was wholly suspended for *six months.* The patient, a boy, became extremely emaciated and the bowels were obstinately constipated. He was also affected with occasional pains in the loins, which were sometimes so severe as to throw him into convulsions. The abdomen was greatly distended, but not apparently with fluid, as it emitted a hollow sound when struck."—*Amer. Journ. Med. Sciences*, vol. iii. p. 198.

and neighboring parts were extensively inflamed.* The suppression of hemorrhoids and of the menses has been known to give rise to this affection; and its occurrence from gouty irritation has been frequently noticed. Dr. Prout observes, that when there are no signs of renal inflammation present, "and the patient has been subject to gout, or if a female, to hysteria, the ischuria may be supposed to depend, in part at least, on spasm." The healing up of old ulcers has also given rise to total suppression of the urine. A very remarkable case of this kind is related by M. Dupont, physician to the *Hospice de Gournay*, in which a lady had an ulcer on one of her legs of twenty-five years' continuance, which was rapidly healed by an ointment. Soon after the ulcer was cicatrized, she was seized with pains in the abdomen, attended with nausea, some fever, red and dry tongue, and abdominal distension. Almost total suppression of urine speedily ensued. After a few days' continuance and ineffectual treatment, a blister was applied over the cicatrix of the ulcer, which had the effect of speedily freeing the patient of her disease. The sudden application of cold to the body, particularly during the flow of the menses, has occasionally given rise to fatal ischuria. The case related by Hastings, mentioned above, was produced in this way; and one of the cases of suppression from renal paralysis mentioned by Sir H. Halford, was excited by the influence of cold, while the patient was under the operation of mercury. It would seem, that ischuria from paralysis of the kidneys, sometimes depends on a disordered state of the brain or of the nerves, without any immediate connection or dependence on inflammation.† "The presence of a mechanical cause may be suspected," says Dr. Prout, "when the person has been previously subject to calculous affections. Generally, however, in this latter case, the effects cannot be ascribed altogether to the simple operation of the *mechanical* cause, but in part also to the inflammation or spasm, or both, which it is liable to produce, and the affection thus assumes a mixed character. A fatal case of this disease is related by Dr. Teeling, which occurred in a very gouty individual. On post-mortem examination, the right kidney was found diminished in size, and the cavity of its pelvis filled with gray-colored, rough calculi, about the size of small peas, and the whole internal surface of the kidney was "firmly coated over with a fine gravel resembling pulverized free-stone." In the upper part of the ureter, belonging to this kidney, a calculus was found as large as a small almond, "which blocked up its cavity." Some calculi were also found in the pelvis of the left kidney.

Prognosis.—The prognosis, in ischuria, is always extremely unfavorable. So long as the suppression is not complete, a reasonable hope may be entertained of an eventual recovery; for even a small secretion of urine by the kidneys will, in general, keep off the more alarming symptoms of cerebral oppression for a considerable time, and give greater opportunities for subduing the renal affection. When the suppression is complete, the disease almost always terminates fatally in the course of four or five days, and often as early as the third day. Sir Henry Halford, in the paper already quoted, states, as the result of his observations, that a *complete* suppression of the secretion of urine cannot continue beyond three days without terminating fatally. This, however, is incorrect. Dr. Laing has related an instance where the secretion of urine was suspended for nine days, and nevertheless terminated favorably;‡ and Dr. Brown mentions one case in which the secretion was suspended for six days and six hours, and in another the suppression continued eleven days, and yet both patients recovered.§ A very extraordinary instance of this complaint is described in *Hufeland's Journal* for August 1827, in which the action of the kidneys was wholly suspended for

* See Dr. Abercombie's Memoir, already referred to.

† [Sympathetic irritation resulting from the influence of severe wounds and surgical operations, occasionally produces a total suppression of urine. I have had this alarming condition continue for three days after an extirpation of a scirrhous parotid.—Mc.]

‡ Edinb. Med. and Surg. Journ., vol. x.

§ Essays, &c. on Medical Subjects. See Med.-Chir. Rev., Dec. 1828.

seven weeks, without any particular inconvenience, although no urinous fluid was secreted vicariously.

Treatment.—The treatment in this affection must be modified according to the particular morbid condition of the kidneys, as well as according to the nature of the remote cause. When symptoms of renal inflammation exist, the treatment already pointed out for the cure of *nephritis* should be energetically pursued. Venesection, cupping, leeching, the warm bath, purgatives, emollient enemata, sinapisms, and even blistering over the region of the kidneys, constitute the principal remedial measures. In cases attended with no decided manifestations of inflammatory action in the kidneys, *diuretics* are the means upon which our chief reliance must be placed. In general, *stimulating* articles of this kind have been found most beneficial—more especially where the disease appears to depend wholly on a torpor or paralysis of the kidneys. Spirits of turpentine, both in the form of injections, and internally in doses of from twenty to thirty drops every two hours, have been employed with a very good effect. When the bowels are constipated or inactive, the turpentine should be given in union with castor oil, in doses sufficient to procure pretty free purging. The remarkable case mentioned above, from *Hufeland's Journal*, was cured by a mixture of oil of amber, Venice turpentine, and balsam copaivæ, after a great variety of other medicines had been ineffectually used. I have seen two cases of incomplete suppression, attended with a somnolent condition, in nervous females, which were removed by a mixture of juniper oil, sweet spirits of nitre, and laudanum.* Mercury has been recommended for the use of this affection, and some interesting cases have been reported, illustrative of its beneficial influence. In the case already referred to, related by Dr. Brown, mercury was freely given; and he states that, very soon after the mercurial fetor of the breath was noticed, a pretty copious discharge of urine ensued, and the patient recovered. Valisneri, also, gives an account of a case which was cured by mercury. In Dr. Laing's case, which, however, was manifestly attended with both local and general inflammatory action, the remedies employed were blood-letting, repeated three times daily, saline diuretics, and the warm bath. Mr. Raymond strongly recommends the application of a large blister across the region of the kidneys. He has related several cases in which the flow of urine soon followed vesication over the loins, after a variety of remedies had been ineffectually employed.† Lieutaud recommends *emetics* for the cure of ischuria renalis.‡

Sect. V.—*Retention of Urine.*

Retention of urine is by no means an uncommon affection; and though not, in general, so dangerous and difficult of being cured as ischuria, it is often met with under circumstances which render it a most alarming malady.

The *immediate* cause of retention of urine consists either, 1, in a loss of the expulsive power of the bladder and of its detrusor muscles; or 2, in mechanical obstruction of the urethra, or neck of the bladder.

1. *Paralysis, or loss of the expulsive power of the bladder*, generally arises from over-distention of this viscus. After the middle period of life, the sensibility of the bladder, in some individuals, gradually diminishes as age advances; and this insensibility occasionally becomes so considerable, that the urine fails more and more to impart the due degree of stimulus to the bladder; in consequence of which it is often suffered to accumulate inordinately, before the desire

* ℞.—Ol. juniper. ℥ss.
Spir. nit. dulc. ℥i.
Tinct. opii ℥i.—M. Take a teaspoonful every two hours.

† Med. Obs. and Inquir., vol. vi. Appendix.

‡ Nonnullos enim decumbentes et cum morte colluctantes hocce præsidiis tempestive adhibito ex orci faucibus ereptos vidi.—*Synop. Prox. Med.*, tom. i. p. 269.

to evacuate it is experienced. The bladder, then, from its torpid and relaxed condition, is incapable of completely expelling its contents, and the action of the abdominal muscles is called into aid to effect this purpose. From this deficiency of the expulsive powers, the bladder is not entirely emptied; and more urine is daily left in the bladder, until at last, only a small portion of its contents is evacuated, at each attempt to urinate. Finally, from the occurrence of slight general indisposition from cold, or from some adventitious local affection, as diarrhœa, suppressed hemorrhoids, riding on horseback, fatigue from exercise, &c., a total inability in the bladder, even with the aid of the abdominal muscles, to overcome the ordinary power of the sphincter, ensues, and complete retention of the urine is the consequence.

Retention from paralysis is not, however, entirely confined to old people, and may arise from difficult parturition; blows or falls on the back; injury of the spine; excessive onanism; and from paraplegia; and it sometimes occurs in the latter stage of typhus, and other forms of low fever.

This variety of the disease is readily distinguished by the facility with which the catheter may be introduced, and by the general course and progress of the complaint. No symptoms indicative of mechanical obstruction of the urethra, or of inflammation, precede or accompany the disease. The approach or tendency to the complaint is indicated by the stream of urine, though sufficiently large, becoming weaker and weaker. The patient is obliged to stand a long time, and to make considerable effort with the abdominal muscles, before the urine begins to flow; and the quantity discharged gradually becomes smaller and smaller, whilst the desire to urinate becomes more frequent and urgent.

Retention from paralysis of the bladder, is much less alarming and dangerous in its consequences, than when the retention occurs from inflammation or obstruction; but it often continues for many months. I have known several instances, apparently of spontaneous occurrence, in which the daily use of the catheter was necessary for three months before the bladder regained sufficient expulsive power to discharge its contents. This form of the disease is not in general attended with much distress, unless the urine be suffered to accumulate until the bladder becomes very greatly *distended*. Indeed, cases sometimes occur, in which the patient is not even aware that a retention of the urine exists; for the bladder may gradually become enormously distended, and give rise to uneasiness, although more or less urine is gradually discharged at each attempt to urinate. Instances of this kind have even been mistaken for abdominal dropsy; for when the discharge of urine, though in diminished quantities, continues, the abdominal distension and uneasiness may, on a superficial examination, be readily ascribed to dropsical effusion.

A case is mentioned as having occurred in St. George's Hospital, where the patient was thought to be laboring under ascites. Paracentesis abdominis was in contemplation, "when the house-surgeon happened to introduce a catheter, and drew off many quarts of water, with immediate reduction of the abdominal swelling."* Similar instances are mentioned in the article on this affection in the *Dict. des Sciences Médicales*. A woman was supposed to be affected with ascites, and tapping was determined on, at the same time that diuretics were diligently employed: finally, in consequence of the sudden occurrence of complete retention of the urine, the catheter was introduced, and a large quantity of water was unexpectedly drawn off. The abdominal swelling soon disappeared. Another case is related, in which retention of the urine was mistaken for dropsy, which, after various measures had been employed ineffectually, was speedily cured by the use of the catheter; and an instance is mentioned in the same work, where the patient died from rupture of the bladder—the patient having been treated for ascites. Dr. Felici, of Milan, has related the case of a woman who considered herself pregnant. She labored under œdema of the feet; enormous

* Med.-Chir. Rev., April 1825, p. 525.

swelling of the abdomen; violent and painful efforts to void urine, which passed off in small quantities; pains in the thigh; dyspnœa; palpitations; a sense of suffocation from the slightest motion; puffiness of the face; frequent pulse; and a dry cough. Under these symptoms she had labored a considerable time before Dr. F. saw her. He suspected retention of urine. The catheter was introduced, and nearly *fourteen pints* of water drawn off.

2. *Retention of the urine from inflammation.*—Inflammation of the urethra and bladder is one of the most common causes of retention of the urine, and may be produced by a great variety of causes—such as irritation from calculus; irritating diuretics, particularly terebinthinate remedies and cantharides; gonorrhœa; stimulating injections into the urethra; the incautious introduction of the catheter or bougie; the spread of inflammation from neighboring parts; an acrid or irritating state of the urine; the sudden suppression of perspiration by cold; cold and damp feet; the suppression of hemorrhoids and the catamenial discharge; excessive venery and onanism; mechanical injuries received on the pubic region or upon the perineum; general fever and constitutional irritation; metastasis of gout and rheumatism, &c. When the neck of the bladder or urethra is inflamed, the penis is usually somewhat enlarged and tender to the touch, and when the exciting cause consists of calculous irritation, considerable pain is generally experienced in the glans penis.

Cases depending on inflammation are attended with severe burning pain in the neck of the bladder, with tenderness to pressure of the perineum and the parts immediately above the pubis. The desire to void urine is very frequent, and extremely urgent and painful. Fever is an early attendant and the patient is apt to experience nausea and occasional vomiting. All attempts to introduce a catheter or bougie give excruciating pain. It must, nevertheless, be observed, that the inflammation upon which the suppression depends, is not always seated in the bladder or urethra, but sometimes in the parts contiguous to the viscus. Thus, retention of urine may arise from inflammation of the rectum, by causing high irritation and vascular engorgement of the mucous membrane of the bladder and urethra, or spasmodic constriction of the urinary passage; or finally, the inflammation may spread to the detrusor muscles, and destroy their powers of regular action. *Chronic inflammation* of the mucous membrane of the bladder is very frequently attended with dysury, strangury. and sometimes with *retention* of urine. Retention from this cause is most commonly met with in old people; and in such as have labored under protracted and badly managed gonorrhœa; or in individuals affected with vesical calculi. It may also arise from metastasis of gout and rheumatism; from hemorrhoidal irritation, and repelled chronic diseases of the skin.

The diagnosis of retention from chronic inflammation and vascular engorgement or tumefaction of the mucous membrane of the bladder, is often attended with considerable difficulty. In general, a sense of tickling and uneasiness is at first experienced in the bladder, extending some distance into the urethra. After some time an almost constant gnawing pain is felt in these parts, with more or less difficulty of voiding the urine; and in some instances temporary incontinence of urine alternates with dysury. The urine discharged contains a large quantity of very viscid mucus mixed sometimes with considerable portions of purulent matter. In this state, the disease may continue for a long time, with occasional attacks of more or less obstinate and painful retention of the urine. In such instances, the whole bladder is usually found, on dissection, contracted, so as not to contain more than half a pint of water, with its coats thickened and indurated, and the internal surface varicose, or covered in parts with concretions of the urinary phosphates. Sometimes ulcers of various sizes, warty excrescences, or a pustular eruption, occurs on the mucous membrane. Retention of urine, from causes of this kind, may be distinguished from enlargement or disease of the prostate or stricture near this gland, by the very gradual progress and increase of the difficulty of passing the urine; and particularly by the slight difficulty which

is in general encountered in introducing the catheter; and, finally, the occasionally temporary incontinence of urine, which, in many instances, occurs. Sœmmering states that chronic inflammation, and the consequences just mentioned, are almost invariably attended with a very peculiar uneasiness and numbness of the thighs, amounting, in some instances, to a state of incomplete paralysis.

The *prognosis* in such cases is always very unfavorable, more especially when there is reason to suspect structural lesion of the bladder.

3. *Spasmodic retention of urine.*—In cases of this kind, the retention occurs suddenly. The patient is seized with extremely painful and urgent efforts to void urine; but only a few drops pass off under great suffering. The pain in the bladder is cutting, and attended with a sense of constriction and pressing down, which by females is often compared to labor pains. The urethra is sensible, sometimes painful throughout, and the patient is often harassed with very distressing erections. The pain is not increased *during the flow* of the small quantity of water that occasionally passes off, but immediately after the last drops are expelled, it becomes very severe, attended with a sensible spasmodic contraction in the perineum. In this way it may continue for a longer or shorter time, until at last the pain and urgency to urinate pass off by a considerable flow of urine. The pain in this variety is not constant, nor is it increased by pressure on the perineum or pubic region. There is no fever, but the pulse is small and contracted. The catheter is usually passed with great difficulty, and often cannot be introduced into the bladder at all.

Spasmodic retention does not, however, occur often as a purely spasmodic affection. In many instances slight inflammation of the bladder, or of some neighboring part renders the neck and upper portion of the urethra so extremely irritable, that the stimulus of the urine causes the sphincter to contract spasmodically. The spasm may also be excited by mechanical irritants. This variety of the disease is most apt to occur in irritable and nervous individuals, and in such as are predisposed to colicky affections. It is sometimes suddenly excited by mental emotions, particularly terror and grief. Gouty and rheumatic irritation; irritation of the rectum from ascarides and other causes; cold and humidity, particularly when applied to the feet; irritating diuretics; hemorrhoidal irritation; gonorrhœa; stimulating injections, by heightening the irritability of the bladder and sphincter muscles, may give rise to spasmodic retention of the urine.

This variety of the disease is not, in general, attended with any particular danger or obstinacy. By frequent recurrence, it is, however, liable to terminate in inflammation, and thus ultimately to give rise to very serious consequences.*

4. *Retention from mechanical obstruction of the urethra or neck of the bladder.*—Obstruction to the discharge of the urine may depend on calculus lodged in the bladder, or impacted in the urethra; stricture, more or less permanent of the urethra; enlargement and induration of the prostate gland; thickening and induration of the mucous membrane of the urethra; pressure from tumors in the neighboring parts, or from the gravid uterus; retroverted, or prolapsed uterus; foreign bodies accidentally introduced into the bladder; polypi and fungoid tumors in the bladder; very viscid mucus and coagula of blood clogging up the urethra; hernia; and a varicose state of the vessels of the neck of the bladder. Of all these causes, however, stricture, and calculi lodged in the urethra, are incomparably the most common causes of obstruction.

Retention of the urine, whatever may be its cause, becomes highly alarming, if it continues beyond twenty-four hours, without being in some degree relieved. In general, complete retention of urine proves fatal in four or five days; and I have known an instance which terminated in gangrene and effusion of the urine as early as the end of the third day. It is generally supposed, that when the bladder at last gives way, and pours out its contents into the cavity of the abdomen, it is *ruptured* or *lacerated* by the violent distension. This, however, is

* Richter, Spec. Thérap., b. iv. p. 392.

rarely the case; for in nearly all instances that prove fatal, the urine finally gains exit through an opening, formed by *ulceration* of some portion of the vesical parietes, or by the occurrence of gangrene and softening, through which the water bursts from the distended bladder. In some instances the lower portion of the bladder forms adhesions with the surrounding parts, and then ulcerates—the urine being infiltrated into the cellular structure about the rectum, scrotum, and perineum. In such cases, extensive mortification and sloughing usually take place in these parts, before the disease terminates in death. Instances have occurred, in which adhesion took place between the bladder and rectum, and the urine was discharged by the anus, with an eventual recovery of the patient. (Richter.) Ulceration and effusion of the urine into the vagina sometimes occur in females. The anterior and superior part of the bladder has been known to ulcerate, so as to give exit to the urine into the cellular tissue of the abdominal muscles, giving rise to extensive œdema of the anterior part of the body and thighs; with gangrene and fistulous ulcerations. Instances have occurred, in which the urine was evacuated by the umbilicus. (Richter.) Most commonly, however, the bladder ulcerates directly into the cavity of the abdomen, and occasions fatal peritonitis. When the bladder gives way, the tumefaction and tension of the abdomen suddenly subside, and the abdominal parietes become soft and relaxed, until peritonitis ensues, when the usual tenderness and tension of this affection occur. Retention of urine does not, however, always terminate fatally by ulceration or rupture of the bladder, and consequent extravasation. Occasionally, death ensues before the bladder gives way, under symptoms resembling those which have been mentioned as occurring in the last stage of fatal *ischuria renalis*. In such cases, the distension is not confined to the bladder, but occupies the whole course of the ureters, which have been found enormously enlarged; and the pelvis of the kidneys, even, is sometimes considerably dilated by the accumulated urine. When these conditions occur, the secretion of urine is ultimately arrested, the patient becomes comatose, or is seized with convulsions or spasmodic respiration, his perspiration acquires a urinous smell, and he finally dies in a state of apoplectic stupor. On dissection, water of a distinctly urinous smell is generally found effused between the meninges, and into the cavity of the brain.

There is another variety of retention of urine—*renal retention*—which arises from an obstruction of the ureters, either by inflammation and obliteration of their cavity, or by being plugged up with calculi, coagula of blood, or compressed by a tumor in some contiguous part. In such cases, the ureter, above the obstruction, becomes more and more dilated, until it acquires, in some instances, a very great size, and the kidney itself ultimately becomes greatly distended. Callisen has seen the pelvis of the kidneys so dilated as to contain nearly a quart of urine; and the ureters have been found dilated to the size of the colon. (Desgranges.) Walter states, that he saw the kidneys so enlarged as to resemble the bladder, with its parietes attenuated almost into a membrane.* Such cases usually terminate fatally under symptoms of cerebral oppression.

The diagnosis of *renal retention* is, however, so extremely difficult and uncertain, that its presence can never be inferred with sufficient probability of correctness, to found on it any practical indications; and it is here mentioned, rather as a pathological phenomenon, than as a subject for therapeutic observations.

Treatment.—From the foregoing observations, it is obviously of the utmost importance, in the treatment of this affection, to be particularly acquainted with the various immediate causes of urinary retention; and never to proceed to the employment of remedial measures, until strict inquiry has been made into the nature of the existing obstacle to the urinary evacuation. From ignorance or inattention to this important rule, diuretics are often given, where the cause consists in permanent stricture; or persevering, rude, and ruinous attempts made to

* Einige Krankh. der Nieren und Harnblase, &c. Berlin, 1802. S. 5–16, tab. ii. iii. and iv.

introduce the catheter, in the same condition of the urethra. There is another point which should be strongly impressed on the attention of the practitioner—namely, never to tamper too long with warm baths, tobacco injections, and various similar remedies, where the obstructing cause resists proper measures for perhaps forty-eight hours—more especially if it consists of stricture or impacted calculus. I have seen two instances which were thus tampered with for five days, and sacrificed to the timidity or want of decision of the practitioner; although the lives of both could, in all probability, have been saved, if tapping had been seasonably performed. In one case where the obstruction was manifestly of a character which precluded all reasonable hopes of being removed sufficiently early to save the life of the patient, tapping was proposed and urged by a *surgeon*, but postponed by the other two *medical* attendants until next morning. On the following morning the operation was again put off until the afternoon, to try the effects of a tobacco enema. In the afternoon the bladder gave way, and the patient died. *In retention of urine from paralysis*, the catheter is the only proper means for evacuating the contents of the bladder; and where the disease is unattended with enlargement of the prostate, its introduction may in general be effected with the greatest ease.* The object here, both in a palliative and curative point of view, is to obviate undue distension of the bladder; and as the loss of its expulsive power is very rarely transient, and the urine reaccumulates with more or less rapidity, it becomes necessary, in such cases, to draw off the urine every six or eight hours. I have known cases, in which this operation was required four times daily for several months, before the bladder recovered its powers. When the distension of the bladder is very great, the urine generally flows off very slowly through the catheter, and unless pretty firm pressure is made with the hands on the external vesical region, the greater portion of the urine will remain in the bladder. Some surgeons recommend the introduction of a flexible catheter, and leaving it in the bladder. When this is done, the external orifice of the catheter must be closed with a small plug, which the patient may from time to time remove, and give exit to the accumulated water. In some cases attended with an irritable state of the urethra and neck of the bladder, this practice may answer very well—more especially when the patient is remote from his surgeon, and cannot be conveniently visited at regular hours. With many patients, however, it causes much irritation, and cannot be borne without great inconvenience.

Whilst proper attention is paid to the regular discharge of the urine, by means of the catheter, remedies should be employed with the view of restoring the lost tone of the bladder. For this purpose, *cantharides*, used both internally and externally, have been generally esteemed a very useful remedy. From twenty to thirty drops of the tincture may be taken two or three times daily, and continued until slight symptoms of strangury ensue. Richter speaks very favorably of a union of cantharides and camphor, in the proportion of a fourth of a grain of the former to one grain of the latter, given four times daily. Frictions with the *tinctura lyttæ*, and terebinthinate embrocations over the hypogastric region, will assist in restoring the contractile power of the bladder. I have known unequivocal benefit obtained from a blister applied over the pubic region; and Richter recommends the application of a fresh onion, beat up into a pulp, to the perineum. The internal use of the spirits of turpentine, of juniper oil, of the animal oil of Dipple, Peruvian balsam, and according to Jahn, the infusion of *solidago virga aurea*, may all be used with more or less advantage in cases of this kind. Cold water dashed upon the lower part of the abdomen and perineum, or injected into the rectum, has been found very beneficial in this affection.† Richter states,

* When the prostate is much enlarged, the difficulty of introducing the catheter is sometimes very great. In such cases, this operation is, in general, much facilitated by the previous application of a poultice made of stramonium leaves, to the perineum.—*See Dr. W. M. Fahnestock's observations on this subject, in the Amer. Journ. Med. Sciences*, vol. v. p. 251.

† Richter, Spec. Thérapie., bd. iv. p. 377.

that in some cases of retention from vesical paralysis, almost immediate and very considerable relief was obtained by pouring water from the spout of a pitcher, in a stream descending several yards, upon the hypogastrium.

Old people often find a great deal of difficulty in voiding the urine—they are obliged to stand a long time before the urine begins to flow, and at last it passes off in a very weak stream, though with little or no uneasiness in the bladder. Persons who are thus affected, may sometimes derive considerable benefit from the use of the *phosphoric acid*, as recommended by Dr. Valentin.* One drachm of this acid is to be dissolved in two drachms of distilled water, of which ten drops should be taken every two or three hours in a little water.

Retention of urine from inflammation requires, of course, the usual efficient local and general antiphlogistic measures. Unless the symptoms of vesical distension be very urgent, it will be most prudent to endeavor to reduce the inflammatory condition of the parts, before an attempt is made to draw off the water with the catheter. A very efficient blood-letting—*ad syncopen*—in robust and full habits, together with the free application of leeches to the perineum, cupping on the iliac and pubic regions, emollient clysters, fomentations, mild purgatives, and the internal use of antimony, constitute the means upon which our main reliance must be placed for removing the malady. Having used local and general depletion, and emptied the rectum by enemata, an anodyne clyster should be given an hour previous to the introduction of the catheter. The catheter will be much more easily introduced into the bladder, and with much less suffering to the patient, after these measures have been efficiently employed. The warm bath, especially the hip-bath, is a valuable auxiliary in such cases. It should be repeated every two or three hours, where conveniences are at hand for its proper employment. The patient may drink moderately of the blandest diluents, and emollient enemata ought to be frequently administered during the day. After efficient general depletion, calomel and opium usually procure more advantage than any other internal remedy. Where the disease is the consequence of an ineffectual hemorrhoidal effort, or of suppressed hemorrhoids, leeching around the anus is especially proper. Whatever other measures be employed, local depletion in this way is one of the most important of our curative means in every variety of inflammatory retention of the urine.

For the *treatment of spasmodic retention of urine*, a great variety of remedies have been recommended. The warm bath often causes the urine to flow almost as soon as the patient is immersed; but in some instances it fails entirely in procuring relief. Various local applications by frictions have been advised, and may be employed with occasional benefit. A liniment composed of two drachms of spirits of turpentine, the yolk of an egg, with six ounces of peppermint water, is particularly recommended by Kieser.† Richter applied bruised onions to the perineum and pubis, with evident good effects. The application of decoctions of stramonium, conium, and of poppy heads, may also be tried with some prospect of benefit in cases of this kind. Anodyne enemata are particularly indicated, and occasionally afford very prompt relief. I have known an instance which had resisted the warm bath, and various other remedies, for five or six hours, speedily relieved by an injection of two drachms of laudanum in about a gill of warm milk, into the rectum. Bingham and others strongly recommend *tobacco injections;* and they sometimes procure very speedy relief; although occasionally, they cause great and even dangerous prostration and distress, without any advantage. Internally, opium, in purely spasmodic cases of the disease, sometimes does much good; but in order to obtain any decided advantage from this narcotic, it should be given in large doses, so as to bring the system fully under its influence. Richter states, that he has known the following pills to relax the

* Archiv. fur Pharmacie, bd i. st. iii. 332.

† Hufeland's Journal, an. 1820, st. iii. p. 92.

urethral spasm in a very short time.* Of late years the *muriated tincture* of iron has been a good deal employed in spasmodic retention of the urine. From twenty to thirty drops should be given every ten minutes until nausea is produced. The late Mr. Cline, of London, speaks in the highest terms of this article as a remedy in this variety of the disease. I have known it to be successfully employed in several instances of this kind. It should be particularly observed, however, that it is only where the retention depends on spasm of the urethra or sphincter of the bladder that any benefit can be obtained from this medicine. There is much reason for believing that it is often given in retention from stricture, and even from inflammation; and that it has thus unjustly lost credit as a remedy in the spasmodic form of the disease. From the decided and speedy relief it procured in the few cases to which I have just alluded, I am well satisfied that it deserves particular attention as a means for removing spasmodic retention. Most writers, in referring to Mr. Cline's experience with this remedy, state that he gave but six or seven drops at a dose; but Dr. Johnson asserts, and no doubt correctly, that this is a mistake, and that Mr. Cline gave it in doses of from twenty to thirty drops every ten minutes, until nausea was produced.

The attempt to introduce the catheter, so long as the spasm of the urethra continues, is almost invariably abortive; and it is, indeed, highly improper to persist in the efforts to pass it into the bladder, where the spasmodic contractions are powerful, and resist the first few moderate attempts. It is surprising with what force the urethra sometimes contracts on the catheter, after it has been introduced to a considerable distance during a temporary relaxation of the spasm. So firmly is the instrument grasped, at times, that it is with difficulty drawn out again. Even where the urethral spasm is so far allayed, by the means just mentioned, as to enable the patient to force out small and interrupted jets of urine, the catheter can seldom be introduced into the bladder without a great deal of difficulty; for the urethra, in such cases, is so extremely irritable, that the irritation produced by the catheter generally excites immediate and insurmountable spasmodic contractions. If we succeed in introducing the instrument too near the bladder, its progress is almost invariably arrested by the contraction of the sphincter and upper portion of the urethra. By holding it awhile in one hand, and gently rubbing the perineum with the fingers of the other, we may sometimes succeed in slipping it in with little or no difficulty.

Retention from stricture, and other mechanical obstructions, is by far the most alarming form of the disease. The means to be employed when the retention depends on stricture in the urethra, are local and general bleeding—particularly by leeches applied to the anus and perineum, and cupping on the lumbar regions. After the action of the pulse has been reduced by these depletory measures, the patient should be put into a warm bath, more especially the hip-bath, and large injections of warm water and oil thrown into the rectum. When the bowels have been thus evacuated, great relief will in general result from an opiate enema composed of barley decoction and fifty to eighty drops of laudanum; and internally five or six grains of Dover's powder every two or three hours, together with a repetition of the warm bath, and the tepid diluent drinks, should be used until the skin becomes uniformly moist. Should all these means fail in procuring adequate relief, it will be proper to introduce with due caution a small bougie, "not to draw off the urine, but with the view of restoring the natural action of the muscles of the parts." Mr. Bell, from whose excellent work the foregoing mode of management is chiefly drawn, gives the following directions for introducing the bougie in such cases: "The patient should be standing or resting, on

* ℞.—G. assafœtid. ℥ss.
P. rad. ipecac.
—opii, āā gr. iv.
Ol. menth. pip. gtt. iv.—M. ft.—Divide into two grain pills. Take ten pills, three or four times daily.

his knees if he is in bed. Take a wax bougie, oil it, soften it, give it the proper curve to pass the turn of the urethra, introduce it into the bladder; now make gentle pressure above the tubes; make the patient exert himself to discharge the urine; sprinkle cold water on his thighs; withdraw the bougie while he continues the effort; and when he has the sensation as if he could pass the urine, withdraw the bougie altogether, and the urine will probably flow." Even where we fail to reach the bladder with the bougie, the patient may often be relieved by pressing a small bougie gently forward, till the point of it has wedged itself into the stricture, when the hypogastrium is to be gently pressed, and the patient directed to exert himself to pass the urine; and at the same time his hands should be put in cold water, or some of it sprinkled on his thighs. (Bell.) If these efforts fail, an attempt may be made with a very small catheter; and where, after all, the stricture is insurmountable, recourse to the operation of puncturing the bladder is the only means left us for preserving the life of the patient. As to the employment of caustic, or of *metallic bougies* for breaking through the stricture, nothing useful can be expected from them, unless the stricture be very narrow, and not situated too high up; which, however, is but very rarely the case. When the symptoms become urgent, and the general and local means already indicated have been ineffectually employed, it would be unnecessarily placing the patient's life in great jeopardy, by relying on the slow, and, after all, uncertain process, of working through the stricture with caustic. With regard to the mode of operating either for puncturing the bladder or laying open the urethra *in perinæo*, above the stricture, and introducing a flexible tube through the artificial opening into the bladder, the reader must consult the writings of surgeons—particularly the valuable treatise on the urethra, &c., by Charles Bell, edited by Mr. Shaw. It may be observed, however, that in retention from urethral stricture, it is not often necessary to puncture the bladder, since an incision into the membranous portion of the urethra above the obstruction, will in general answer every purpose that can be obtained from an operation of this kind. It would seem, that, at present, the majority of surgeons prefer the suprapubian operation, where puncture of the bladder is determined on. When retention from pregnancy cannot be relieved by pushing up the bladder, or by change of position during the efforts to pass water, such as lying down on the back with the hips raised, the catheter is the only proper means for relief. If the pressure of the uterus against the urethra opposes the introduction of the catheter, the patient must be placed on her back, with the hips elevated, and the womb pushed up with the finger of one hand, whilst with the other the catheter is introduced. When the suppression is connected with retroverted uterus, the bladder is usually raised so high above its proper location, that it becomes necessary in general to use the male catheter, in order to reach the cavity of the bladder.

Sect. VI.—*Dysury.*

Difficulty and Pain in voiding Urine—Strangury.

Difficulty and pain in making water, without any particular tendency to retention of the urine, is a very common complaint. In general, whatever is capable of increasing the irritability of the bladder, or of giving rise to the secretion of an acrid urine, will cause more or less pain and difficulty in voiding the urine. It is particularly apt to occur where there is an excess of uric acid secreted with the urine; and where the urine is charged with the earthy phosphates, it is seldom absent—although in this latter case the urine is generally more copious than natural, and does not properly come under the designation of *disury*, which implies *difficulty* in passing the urine, as well as pain. The usual sensations of disury are—uneasiness in the neck of the bladder; frequent, painful and slow micturition, with a sense of tenesmus or straining *in perinæo*—particularly at

the moment the last drops are voided; and a cutting or burning sensation in the posterior part of the urethra. It may be produced by a great variety of causes, such as excess in eating, and in drinking spirituous liquors; the free use of condiments; irritating diuretics; onanism; excessive venery; acid ingesta; inflamed hemorrhoids; ascarides; suppressed catamenia; the irritation of vesical calculi; astringent injections; redundancy of lithic acid, or of the phosphatic sediments in the urine; leucorrhœa; repelled cutaneous affections; rheumatism and gout. It occurs in inflammatory fevers, particularly in hepatitis, jaundice, scurvy, and from verminous irritation and dentition in children.

Strangury is an extremely distressing affection. There is a continued urgency to void urine, which passes off in small quantities, or drop by drop, with the most severe burning and cutting pains in the neck of the bladder. Cantharides are peculiarly apt to give rise to this affection; and some individuals are so very susceptible in this respect, that they cannot have a blister applied to any part of the body, without suffering more or less from strangury. The spirits of turpentine, also, is very apt to occasion this painful irritation of the neck of the bladder.

Treatment.—Where there is reason to suppose that the disease depends on simple irritation of the neck of the bladder from some accidental cause—as injections, gonorrhœa, &c.—it will, in general, suffice to empty the bowels by mild laxatives, and to order copious draughts of bland diluent drinks, such as barley water, flaxseed tea, or a solution of gum Arabic, and perhaps an anodyne enema, and rest.

When the disease is dependent on an excess of the lithic or phosphatic sediments, the measures already mentioned under the head of *lithiasis*, for counteracting these secretions, must be resorted to. "When the urine is perfectly natural both in quantity and quality, and contains no mucous, purulent, or bloody deposit, there is reason to infer that the cause of the irritation is not connected with the urinary system, and must be sought for elsewhere, as in the rectum, or uterine system in females." (Prout.) Should it depend on a hemorrhoidal effort, recourse must be had to the means mentioned in the chapter on hemorrhoids, for counteracting it. Nervous and hysterical females are liable to extremely violent pains in the neck of the bladder and urethra, and which are generally most intensely felt immediately after discharging urine. Opium and camphor is the only remedy that I have found decidedly useful in cases of this kind. Four or five grains of Dover's powder, with three grains of camphor, taken three times daily, will seldom fail to remove the complaint.

Infants, as has been already said, are subject to violent pains of this kind in passing urine during the process of dentition. The existence of the complaint is recognized by the violent shrieks which they utter on voiding the urine. The proper treatment in such cases is to open the bowels freely with castor oil, or rhubarb, and to exhibit twice daily one-sixth of a grain of calomel, with a fourth of a grain of ipecacuanha. In the evening, a drop or two of laudanum should be administered. I have never failed of speedily removing the affection by these remedies. When the cases are attended with a copious secretion of the phosphate of ammonia (an occurrence by no means uncommon), magnesia, which is so frequently administered to infants, is decidedly prejudicial.

In old people, this affection is generally attended with a diseased condition of the internal coat of the bladder, or calculous irritation, or disease of the prostate. The careful physician will, of course, endeavor to ascertain the cause; and for this purpose it is particularly important to examine the urine, and the state of the prostate, by examining through the rectum.

Females subject to leucorrhœa are apt to suffer the most excruciating pains on voiding urine, from an extremely irritable and tender state of the orifice of the urethra. So sensible is this part in some cases of this kind, that the slightest touch with the finger gives rise to extreme pain. I have found no remedy so effectual, in cases of this kind, as a weak solution of lunar caustic. Two grains to an ounce of water, to which a watery solution of opium is to be added, should

be used two or three times daily as a lotion to the part; and a little lard applied with the finger after each application of the wash. A strong solution of borax will also sometimes give relief; and I have used the citron ointment, mixed with an equal quantity of oil of almonds, with much benefit. At the same time, however, that these applications are used, it will be necessary to use frequent injections of a weak tepid solution of sulphate of zinc, or of alum, into the vagina, and to employ other means for counteracting the leucorrhœal affection.

For the relief of strangury, caused by cantharides, &c., and which consists of a slight degree of inflammation of the neck of the bladder, copious draughts of mucilaginous diluents, opiates, fomentations, and, where it is extremely severe, leeching at the perineum should be used. An anodyne enema will, in general, procure very considerable relief. The Germans are in the habit of administering camphor for the removal of strangury; but although I have used it repeatedly, I have never known it to afford any unequivocal advantage. The free use of flaxseed tea, or of barley water in conjunction with the *spirit. ether. nitrici*, and an opiate enema, will rarely fail to allay the suffering very materially. Dr. John Davy asserts that the introduction of a catheter almost invariably procures immediate relief in strangury from cantharides. "It should be introduced with delicacy and caution, just slipped into the neck of the bladder, and kept in only a few seconds. The process is seldom very painful, and the relief is almost immediate."*

Sect. VII.—*Enuresis—Incontinence of Urine.*

This, though not in general a painful affection, is always a very troublesome and distressing complaint. The urine passes off involuntarily; sometimes constantly, in drops, as it is secreted and conveyed into the bladder; at others, only after a considerable portion has been accumulated in the bladder, the impulse coming on so suddenly and irresistibly, that the utmost efforts of volition are not able to restrain its immediate flow. In some instances the involuntary discharge occurs by day and night, whether the patient be awake or sleeping; in other cases, by far the most common, it takes place only at night, during sleep. This affection may, therefore, be divided into three varieties.

1. *Enuresis paralytica.*—In incontinence of urine from paralysis of the sphincter of the bladder, the urine passes off continually, as it is secreted by the kidneys, without pain, and even without the least sensation of its occurrence. In such cases the diagnosis is not, in general, attended with difficulty. In very old people it is, nevertheless, not uncommon to find the urine to dribble off involuntarily, without any particular paralytic affection of the sphincter. These cases occur in the slighter instances of partial retention of the urine, from a weakened state of the expulsive powers of the bladder; for, when the urine accumulates in the bladder to a certain degree of distension, the resistance to a further dilatation of the bladder, in conjunction with the pressure of the abdominal muscles, slowly forces the urine into the urethra, and causes it to pass off *guttatim*.

This variety of incontinence often occurs as a symptom of some general disease. Thus, it is frequently met with in the latter stages of low fever—in paraplegia and hemiplegia; and it is occasionally the consequence of concussion of the brain and spinal injuries. Richter observes, that an inability to retain the urine has arisen from plunging into very cold water. Among the local causes of this affection the most common are: difficult parturition; injuries done to the neck of the bladder by the unskillful employment of obstetrical instruments; a large calculus located in the neck of the bladder; lythotomic operations; great dilatation of the neck of the bladder in the extraction of a calculus.

The *prognosis* in this variety of the disease is generally unfavorable, and when

* Edinb. Med. and Surg. Journ., 1828.

it occurs as a symptom in febrile affections, it is always one of the most dangerous indications. Mere local paralysis of the sphincter of the bladder is, indeed, not dangerous, so far as the life of the patient is concerned, but it is an exceedingly annoying complaint, and by the urine constantly dripping off, very painful and distressing excoriations on the inner part of the thighs, scrotum, and perineum, almost always occur.

2. *Enuresis from mechanical causes*, independent of paralysis of the sphincter of the bladder, is not unfrequently met with. Most of the mechanical or organic causes mentioned under the head of *ischuria*, may, under certain circumstances, give rise to incontinence of urine. Tumors pressing on the bladder —as the gravid uterus; dropsical or scirrhous enlargement of the ovaria; tumors of the mesenteric glands of the rectum, and of the neck of the uterus—have been known to give rise to this affection. It may also be produced by prolapsus uteri; hernia, or prolapsus of the bladder; by the irritation of vesical calculus; tumors and excrescences from the internal surface of the bladder, &c. These causes seem to operate in the production of incontinence of urine by the pressure which many of them make on the bladder, and by the almost constant *nisus* to evacuate the urine by which the sphincter may at last become so debilitated and relaxed, as to suffer the urine to pass off slowly and involuntarily; and cases have occurred, which arose from ulcerative destruction of a part of the sphincter.

3. There is a variety of incontinence of urine, described by Richter, under the name of *enuresis spastica*, which sometimes occurs in very nervous or hysterical individuals, and which may, therefore, with more propriety, be called *nervous enuresis*. The inability to retain the urine occurs in sudden and irregular attacks. The patient suddenly feels a most urgent desire to void the urine, and the impulse is so irresistible, that, in spite of the utmost efforts of volition, the urine immediately passes off without allowing time to withdraw, or even to reach for a vessel. This variety of the affection occurs also occasionally in very young children. Its most common *exciting* causes appear to be—ascarides; hemorrhoidal affections; suppressed catamenia; gouty irritation; and leucorrhœa. Frequently, however, no obvious causes of this kind are present, and the disease apparently arises from a morbid irritability of the urinary passages, in connection usually with a very excitable or nervous state of the general system.

4. *Enuresis nocturna.*—This is a very common complaint among children, and occurs also occasionally in adults. When awake, the individual subject to this affection experiences no inconvenience whatever in this respect; but at night, while sleeping, *and lying on the back*, the urine is apt to pass off, either *involuntarily*, and without the least consciousness of its occurrence, or *voluntarily*, under the influence of a dream. In children this variety of incontinence of urine is often "associated with some tendency to urinary disease, and very frequently a disposition to gravel; or sometimes, as in young females, with constitutional irritability and weakness; and in advanced life this affection is almost always associated with some organic or other affection of the neck of the bladder or prostate gland." In those cases where the discharge occurs in consequence of a voluntary effort during a lively dream, the urine, on examination, will almost invariably exhibit "some unnatural property, and most generally a strong disposition to, or actual deposit of gravel. Hence," says Dr. Prout, "I have been led to infer that in this species of urinary incontinence, the acrid properties of the urine are chiefly in fault, and that these, favored, perhaps, by the position of the body, and, probably, also, by the morbid sensibility of the bladder, excite so vivid an impression on the imagination, as actually to lead to a voluntary discharge of the urine." That urinary incontinence may occasionally occur in this way cannot be doubted; but it may justly be questioned whether the causes here assigned are so commonly concerned in the production of the affection as is supposed by the author just quoted. It is certain that we may sometimes prevent the recurrence of the evacuation by exhibiting remedies calculated and intended to produce an irritation or tenderness in the neck of the

bladder; as, for instance, cantharides—a circumstance that does not seem to favor the idea that the affection depends on the irritation of acrid urine. Habit, no doubt, often has a principal agency in keeping up this affection. When children neglect to pass off the urine on going to bed, the bladder is apt to become distended in the course of the night. This stimulus excites the brain, and awakens a lively dream, occupied with a desire to urinate, and the sphincter yields to the instinctive effort to void the urine.

In cases where the urine passes off involuntarily, and without the person being conscious of it during sleep, Dr. Prout thinks that there probably always exists "some morbid condition of the urinary organs," which it is in general extremely difficult to overcome, and continues often, long after the age of puberty.

Treatment.—From the foregoing remarks on the various and very distinct character of the causes and pathological conditions of urinary incontinence, it is obvious, that the modes of treatment proper for its removal must be equally various and diverse in different cases. When the incontinence depends on general palsy, recourse must be had to the treatment mentioned under the heads of paralysis. In instances of urinary incontinence from mere local paralysis of the *sphincter vesicæ*, without any manifest spinal affection, or organic cause, we must endeavor by tonics and local stimulants to re-excite the activity of the sphincter. Among the means that have been proposed for this purpose, the following are the most important. *Alum*, in doses of twenty grains every four hours, with mucilage of gum Arabic. This, according to Selle, has occasionally removed cases of long continuance. The *tincture of cantharides* will sometimes produce a very good effect. It should be given in gradually increased doses three or four times daily, until a feeling of ardor urinæ or strangury ensues. Dr. Otto, of this city, has recently published an account of three cases of incontinence of urine, which yielded under the employment of uva ursi and the muriated tincture of iron. One of the cases was congenital, and the remaining instances were inveterate. During the present summer, I prescribed these remedies in a long-standing case, and the result was entirely satisfactory.* Externally, cold bathing or cold water poured from a height on the pubis, and dashed upon the perineum, will sometimes do good. Richter recommends *cold injections* into the bladder; and in females, cold water may be beneficially injected into the vagina. *Electricity* and galvanism have also been employed with success in cases of this kind.† *Stimulating frictions*, of various kinds, will occasionally assist in restoring activity to the sphincter. M. Lair, in a memoir of this affection, refers most cases of incontinence of urine to a want of equilibrium in power between the body of the bladder and its neck, the latter being in an atonic or relaxed condition. This view of the subject led him to seek for a mode of stimulating the neck of the bladder, without affecting its body. With this intention, he introduced, by means of a catheter, the tincture of cantharides, so as to touch the urethra in a prostatic part, as well as the neck of the bladder; and he affirms that by this mode of management he cured three cases of this malady.‡ Dry cupping the perineum and blisters applied to the sacrum are also very useful measures in cases of this kind. M. Canin has lately related two cases before the French *Academy of Medicine*, which were cured by these applications. In one of them, in a lad about fourteen years of age, the disease had already continued two years. It required eighteen applications of the cups in the course of a month, before the cure was effected. In the other case, also in a young person, the cups were applied twenty times, and a blister laid over the sacrum before the cure was completed. In both instances, various means had been tried without any apparent advantage.

In urinal incontinence from mechanical causes, we can seldom do more than

* North American Med. Journ., Oct. 1830.
† Loder's Journ. der Chirurgie, b. iv. hft i.
‡ Med.-Chir. Rev., January 1827, p. 244.

palliate the disorder, or procure temporary relief. When it occurs from the pressure of the gravid uterus, nothing but the delivery of the child will in general remove the complaint; yet in some instances, incontinence of the urine occurs about the third and fourth month of pregnancy, and after having continued for a time, goes off spontaneously, before the termination of the regular period of gestation. In *nervous* or *spastic* urinary incontinence, anodyne enemata, together with uva ursi in union with Dover's powder, or with the extract of stramonium, and the employment of tonics—particularly iron, quinine, and the oxyde of zinc —with a nourishing and digestible diet, regular exercise in the open air, early rising, and, in general, whatever is calculated to invigorate and to allay the morbid irritability of the system, constitute the appropriate means in cases of this kind. Wendt speaks very favorably of the expressed juice of the *mesembryanthemum crystallinum*, in the incontinence of urine which occurs in very nervous individuals. When the patient is affected with leucorrhœa, or ascarides, or with an irritated state of the rectum from hemorrhoids, particular attention should, of course, be directed to the removal or mitigation of these affections.

For the removal of *enuresis nocturna*, a great variety of means have been proposed, but they have not been very often applied with much success. The disease generally disappears, as children approach the age of puberty, and often at a much earlier period; and this occurs apparently from the powerful influence of a sense of shame, and a determination, during the waking state, to resist the desire to micturate, which occurs in dreams during sleep. Mr. Prout observes, "that when the incontinence in children is associated with gravel, it is of the utmost consequence that this circumstance be attended to; and that the remedies appropriate for counteracting the formation of these urinary deposits, should be employed before any other means are used to restrain the urinary incontinence," for without this almost all other remedies will be in vain. The urine should therefore be carefully inspected, both in its recent state and after it has stood awhile; and if a sediment either of the lithic acid or phosphatic variety be deposited, recourse should be immediately had to the remedial measures mentioned under the head of *lithiasis*, in a preceding section of this work. After this object has been accomplished, we may proceed to the employment of tonics and some one of the various remedies or modes of management which experience has shown to be capable of doing good. Among these, there is no article which has been more generally prescribed than the tincture of cantharides, with the view of producing a slight degree of strangury, or considerable ardor urinæ; so that the pain excited by the first efforts to micturate, may excite and awaken the patient, and thus interrupt the habit which always ultimately contributes chiefly to the recurrence of the discharge. This article may be beneficial also, by increasing the sensibility and activity of the sphincter, and thereby enabling this muscle to make greater resistance to the expulsive efforts of the bladder. The same effect may sometimes be derived from the application of a blister to the sacrum. I have known an instance of long standing, removed by the use of the spirits of turpentine, in doses of from fifteen to twenty drops three times daily, until a considerable degree of ardor urinæ was produced. Where these remedies do not afford relief, and there is reason to believe that the incontinence depends on a morbid irritability of the neck of the bladder, which is often the case in adults, an opiate administered on going to bed, will sometimes have the effect of preventing the evacuation during the night. Children should always be required to empty the bladder just before going to bed, and when they awaken at night, they ought to be taught to rise and pass off the urine. By this, we may often prevent the occurrence of the disorder, and even occasionally obviate it after it has occurred.

Mr. Charles Bell makes the following observations in relation to this subject, and which are worthy of particular attention in the management of this complaint. "Incontinence of urine," he says, "never takes place *but when the boy is asleep upon his back;* and the cure is a simple one. He is to accustom himself to sleep upon his face or side; the urine is not passed, nor is he excited to dream

of making urine, while he keeps this position. The circumstance is unaccountable, until we reflect on the position of this master-spring of the muscles of the bladder—*the sensible spot, a little behind and below the orifice of the bladder.* When a person lies upon his belly, the urine gravitates towards the fundus; but when he lies on the back, it presses upon this sensible spot, and distends that part of the bladder, which is towards the rectum."

CHAPTER VIII.

CHRONIC DISEASES OF THE SEROUS EXHALANT VESSELS.

Hydrops—Dropsy.

Dropsy, or rather the effused and accumulated fluid which constitutes the most conspicuous external character of this disease, must be regarded only as an *effect* of a primary morbid condition of the solids. This morbid condition of the solids constitutes the essential malady, to which the physician's attention must be directed in order to obtain rational views concerning its nature and remedial management. The cure of this disease does not depend merely on the removal or evacuation of the aqueous accumulation, but principally, if indeed not entirely, on the removal of that disordered state of the vascular system, upon which the dropsical collection depends. Here, then, the fundamental question meets us: In what does this morbid condition of the solids consist, and in what particular structure is it chiefly located? According to the late Dr. Rush, the morbid action which gives rise to dropsical accumulations, is seated in the arterial system, and is, in its nature, closely allied to inflammation. Dropsical accumulations, agreeably to his views, are the result of an increased action of the exhalent vessels, attended with a general pyrexial condition of the system. The correctness of this doctrine is now very generally, we might perhaps say, universally admitted. Indeed, the removal of dropsy from the cachexia to the pyrexia, is justly regarded as one of the most important of modern improvements in pathology. That the increased secretion or effusion of serum, which occurs in dropsy, depends on a condition which, if not identical, is at least closely allied to inflammation, receives the greatest degree of probability from the following circumstances:

Every one who has observed the progress of inflammation, knows that at the period when the inflammation is passing off, or changing to the subacute or chronic state, an effusion of serum is apt to occur into the surrounding cellular tissue or contiguous cavities. Thus, rheumatic inflammation, gout, and sprains, frequently pass off by an effusion of serum into the circumjacent cellular structure. It is well known, too, that hydrothorax is by no means an uncommon sequel of pleuritis; and hydrocephalus of arachnitis. Indeed, the pathological fact, that all inflammations of the serous membranes, if not very violent, or speedily terminated in resolution, end in effusion, is directly corroborative of the correctness of this view of the pathology of dropsy. It is therefore highly probable, that the morbid action which exists in the tissues from which the dropsical effusions occur, partakes more or less of the nature of inflammatory excitement; but it seems likely, that it is always of the lowest grade of phlogosis, amounting, in some instances, probably, only to an irritation bordering on actual inflammation. It would appear, indeed, that a *considerable* degree of inflammation is incompatible with serous exhalation—and that this effect can occur to any material extent, only where the vascular irritation is somewhat below the grade of actual inflammation.

To this doctrine of the nature of dropsy, objections of much plausibility have been urged. When duly estimated, however, they do not appear to possess any solid value. It has been stated, for instance, that dropsy is not unfrequently the consequence of profuse hemorrhage and of other exhausting causes, and that in such cases at least, neither the general symptoms, nor the nature of the causes, justifies us in considering the disease as one of an inflammatory character. Against this, however, it may be observed, that local irritative or inflammatory action, and great debility and exhaustion, are by no means incompatible. Sub-inflammation may exist in one structure or organ, whilst the general system exhibits all the characteristic traits of debility and cachexy. The post-mortem phenomena which occur in the human subject, and in animals who have died from hemorrhage, would seem to show, indeed, that even in dropsies from hemorrhage, there exists a morbid state allied to inflammation in the membranous structures from which the effusion occurs. The experiments of Mr. Seeds and of Kellie show that in animals bled to death, the meninges of the brain, and other membranous tissues, almost invariably exhibit a highly injected and congested state, similar, in all respects, to what occurs in actual inflammation. In many instances of this kind, a considerable quantity of watery effusion was found within the head; and in some instances, high and tumultuous action of the heart and arteries occurred shortly before the animals expired. I have met with several cases, in which internal inflammation occurred, apparently in consequence of excessive losses of blood. I attended a gentleman, a few years ago, who was reduced to the utmost degree of exhaustion compatible with life, in consequence of a long-continued and almost uninterrupted loss of blood from the rectum, and who finally became anasarcous over the whole body, while at the same time his eyes were very considerably and obstinately inflamed. The phlogistic character of dropsy is sometimes strikingly illustrated by the conversion of inflammatory diseases into dropsy, and *vice versâ*. In a late number of the Medico-Chirurgical Journal, there is a case related, in which rheumatism was successively converted into dysentery, erysipelas, peritonitis, and finally, dropsy.*

Although it must be admitted, that *increased exhalation of serum* constitutes the chief immediate cause of dropsical accumulations, yet it is probable that there always exists a simultaneous *diminution* of absorption in the surface from which the effusion takes place. In the first place, it may be observed, that vascular irritative excitement or inflammation in a part is necessarily attended with a preternatural afflux, and consequently, sanguineous congestion in such part. This being the case, it follows, that the capillaries of the structures from which dropsical effusion occurs, must be in a state of repletion or sanguineous congestion. Now, it is a truth, I believe well established, that the function of absorption from the cavities and cellular tissue, is chiefly, if not entirely, performed by the venous extremities. The experiments of Magendie, or Meckel, of Tiedemann and Gmelin, have placed this physiological fact beyond all reasonable doubt. It appears, moreover, to be equally well established, that the process of absorption is accelerated or diminished, according as the capillaries contain a less or greater quantity of blood. When they are full and congested, and the current of blood moves along sluggishly, absorption is comparatively slow, and *vice versâ*. This fact was long ago noticed by Home in his Essay on Croup. "The less blood," he says, "there is in the veins, the more rapidly will absorption be effected." When it is considered, therefore, that the tissues from which the dropsical effusions occur, are, as is believed, in a state of sub-inflammatory action, or at least of vascular irritation, and that the capillaries of these tissues must consequently be in a state of fullness or congestion, it would seem to follow, that the process of absorption must be correspondingly diminished. Hence, in every case of dropsy, there are, probably, two simultaneous morbid conditions present, namely, *increased exhalation*, and *decreased absorption*.

* Med.-Chir. Rev., vol. vi. p. 197.

Etiology.—The principal occasional causes of dropsy are mechanical obstructions to the free return of blood to the heart; the influence of cold; excessive hemorrhages; disease and inactivity of the kidneys; repelled cutaneous eruptions; suppressed habitual discharges; chronic diseases which tend to exhaust the system; arsenic; and some of the acute exanthematous affections, particularly scarlatina and measles. Dr. Ayre, in his treatise on this disease, denies that mechanical obstruction ever has any direct agency in the production of hydropic effusions. When dropsy supervenes on scirrhus of the liver, he considers it the consequence of the slow inflammation of the indurated viscus, extending to its peritoneal covering, and thence along the abdominal peritoneum. It is not improbable that the disease may, in some instances, be developed in this way; but it seems much more likely, that the congestion which necessarily occurs in the portal system in such cases, produces, by degrees, that irritated condition of the peritoneal capillaries which gives rise to the effusion. It is a well established fact, that habitual sanguineous congestion in a part, tends ultimately to excite a low degree of inflammation. We may reasonably presume, also, from the above observations on the influence of vascular turgescence in diminishing absorptions, that this process is in such cases morbidly diminished, even before capillary irritation and consequent preternatural exhalation have commenced. The influence of obstructions to the return of blood to the heart, in producing serous extravasations, is sufficiently illustrated by the œdema which occurs when ligatures are passed round an extremity.

Cold rarely produces hydropic affections, unless there exists a predisposition to the disease. Of all the causes which predispose to the occurrence of dropsy from the influence of cold, the most powerful are scarlatina, measles, and the mercurial excitement. Neither these two exanthematous affections, nor mercury, are apt to give rise to dropsy, unless they co-operate with cold, or vicissitudes of atmospheric temperature. They leave the surface of the body in a highly sensible and irritable condition, and the cutaneous exhalation is usually carried on freely during the period of convalescence. When the body, in this condition, is exposed to the influence of cold, the cuticular exhalants are particularly liable to become torpid; and congestion in the capillaries of the subjacent cellular tissue almost necessarily ensues. This tissue being already predisposed to morbid excitement from the previous exanthematous affection, passes readily, under the combined influence of these circumstances, into a state of irritation or sub-inflammatory action, whence dropsical effusions proceed. It is not improbable, however, that in some instances of dropsy from scarlatina or measles, the disease may be the immediate consequence of the extension of the inflammation or irritation from the skin to the subjacent cellular texture. The fact, however, that dropsy from these affections occurs but very rarely when the patient is carefully protected from cold, would seem to show, that the disease is not apt to arise from an extension of the inflammation to the cellular tissue.

Dropsies from cold are frequently attended with slight catarrhal symptoms, and are always manifestly of a phlogistic character. When blood is drawn, it is generally found sizy; and the pulse is tense, quick, and frequent—more especially in those cases which occur as the sequela of scarlatina or measles. The effusion generally takes place very rapidly. The variety of dropsy which most commonly proceeds from cold, is *anasarca*, although some degree of abdominal effusion is not uncommon.

In relation to dropsies from excessive hemorrhage or other profuse and long-continued discharges, we have two observations to make, in elucidation of their etiology. In the first place, it would seem to be well established, that excessive losses of blood are almost invariably attended or immediately followed by irregular determinations, or foci of congestion, in one or more of the serous membranes. It is thus that the red and injected appearance of the arachnoid and other membranous structures occurs in animals, when killed by bleeding. The structures which may have thus become the foci of determination, gradually pass into

a state of irritated action, which ultimately, in most instances, gives rise to dropsical effusions. There is, however, another circumstance connected with the production of dropsy by excessive losses of blood, which, though little estimated by pathologists, has, I am convinced, an important concern in the causation of the disease. I have already observed above, that immediately after a profuse loss of blood, absorption goes on with unusual activity. The blood-vessels are rapidly replenished with crude fluids; for, the absorbents being extremely active, nearly all the aqueous fluids received into the stomach are speedily absorbed into the circulation; and this is especially favored by the very great thirst which almost always occurs after excessive sanguineous losses. The blood being thus inordinately supplied with a crude and watery fluid, becomes more irritating to the heart and capillaries, and diluted to such a degree as to pass off more readily by the exhalants. That this is not a hypothetical view of the subject, is shown by the experiments of Harles and Schulze, both of whom rendered animals hydropic by drenching them copiously with water, after they had abstracted from them large quantities of blood. Haller also bears testimony to the fact, that copious hemorrhages produce an increase of serous fluid in the blood.

Dropsy from hemorrhage is generally of the anasarcous kind. The blood, in these cases, always contains a very great over-proportion of serum, the crassamentum being very small, usually cupped, and often covered with a buffy coat. The pulse is frequently full and active, though not hard or tense. Dropsical effusions from hemorrhage, rarely supervene immediately after the loss of the blood. Several weeks usually intervene between the hemorrhage and the occurrence of the dropsical swellings.

Disease or torpor of the kidneys is another, though not a very common cause of dropsy. Dr. Bright* has recently published some interesting cases of this kind. In nearly all these instances, the kidneys were found in a state of disorganization. In dropsies depending on deficient urinary secretion from renal torpor or organic disease, the urine invariably contains a portion of albuminous matter.

Among the causes of dropsical effusions, we may also mention amenorrhœa, diabetes, chronic gout, the intemperate and habitual use of spirituous liquors, and in short, almost every chronic affection or cause which is capable of exhausting the constitution, or causing important functional lesions.

General symptoms.—A dry and harsh skin is almost universally present. The appetite is usually impaired—but when the disease is the consequence of hemorrhage, the appetite for food is sometimes particularly strong. The thirst is generally considerable, and sometimes very urgent. The bowels are commonly inactive, though readily moved by laxatives. The pulse is irritated, and usually indicative of a pyrexial state of the system; for however small and febrile, it is almost always quick and frequent. The urine is scanty and generally of a deep red color; sometimes jumentose—and occasionally, though rarely, whey-like or chylous.

In a diagnostic point of view, much attention has of late years been paid to the appearance and character of the urine. Dr. Blackall has investigated this subject with minute attention; and the observations of Ayre and Wells have thrown further light on it. The circumstance which has particularly occupied the attention of these physicians, in relation to this subject, is the absence or presence of coagulable matter or serum in the urine of hydropic patients. In many instances of this disease, a greater or less proportion of coagulable serum exists in the urine, whilst in others this excretion is wholly devoid of coagulable matter. Observation would seem to show, that this occurrence is intimately connected with the general state of the system; for it would appear that in those cases of dropsy which are attended with an obvious phlogistic diathesis, and especially such *as arise from the influence of general causes*, the urine, with

* See his *Reports of Medical Cases.* London, 1827.

scarcely an exception, contains a large quantity of coagulable serum. The quantity of serum mixed with the urine, may therefore be regarded as a pretty correct index of the degree of general inflammatory excitement attending the disease. Serous urine may be considered as a kind of *pyrexometer* in hydropic affections, which, though not universally to be relied on, is yet sufficiently constant to entitle it to the attention of the practitioner. I am satisfied, from considerable attention to this subject, that in almost every instance where there is coagulable serum in the urine of dropsical patients, the general condition of the system will be found manifestly phlogistic. In the dropsies which occur after scarlatina, the urine generally contains a large portion of the serum; whilst in local dropsies, and in which the general vascular system does not participate, little or no serum is detected in the urine. (Ayre.) When the urine is high colored, scanty, and, on cooling, deposits a red sediment, or remains muddy, the liver, probably, is in a state of organic disease. (Cruikshank.)

After all, it is highly probable, from what is said above, that every case of dropsy is essentially phlogistic, so far at least as relates to the immediate local excitement which gives rise to the effusion. The general system, however, does not always participate in the local affection—the heart and arteries receiving no sympathetic impulse from the local, irritated, or sub-inflammatory action. In such cases, the general circulation is languid, and debility and relaxation characterize the disease. Where the heart and arteries do sympathize with the local hydropic affection, and this is by far most commonly the case, the pulse will manifest more or less of a pyrexial state, being sometimes full, hard and active, or small, tense, quick and frequent.

1. *Ascites—Dropsy in the Cavity of the Abdomen.*

Ascites, or abdominal dropsy, is very generally dependent on visceral induration, more especially on scirrhus of the liver or spleen. Whatever, therefore, has a tendency to produce induration of these viscera, may become the remote cause of this form of dropsy. Among the most common and powerful of these causes, may be ranked the habitual and intemperate use of alcoholic liquors; protracted agues; hepatitis; and inveterate dyspepsia. Whatever may be the remote cause of ascites, however, *chronic inflammation of the peritoneum* constitutes, no doubt, the immediate and essential cause of the abdominal effusion. Subacute inflammation of this membrane, in whatever way it may be produced, terminates perhaps always in effusion; although in some instances this may not be so copious as to constitute dropsy. In the majority of fatal cases of ascites, the peritoneum exhibits a highly injected state; and, in many instances, the traces of previous inflammation are still more conspicuous and unequivocal, its structure being either thickened or otherwise altered, or covered with an infinitude of miliary tubercles. Occasionally, indeed, no marks of pre-existing inflammation whatever are to be seen; but the investigations of modern pathologists have rendered it abundantly manifest, that where no disorganization or structural change has been effected, the mere redness, or injected state of the inflamed parts may, and does often disappear *in articulo mortis*, or even *post-mortem*.

Besides the causes I have just mentioned, it will be sufficient to observe, that everything which is capable of producing slow inflammation of the peritoneal lining of the abdominal cavity, may give rise to this variety of dropsy: such as cold; parturition; blows on the stomach; enteritis; metastasis of cutaneous eruptions; gout, or rheumatism; suppressed habitual discharges; and infarcted bowels.

Diagnosis.—The only condition which is likely to be mistaken for ascites is pregnancy. From this state it may be distinguished by the fluctuation; the uniformity of the tumor; the lateral pressure and distension of the abdomen on lying on the back; the oppression of breathing on lying down, so as to raise the pelvis and abdomen higher than the chest; the thirst; the paucity of the urine;

the dryness of the skin ; which characterize effusion into the abdomen. And, on the other hand, the absence of the peculiar symptoms of pregnancy assists us in forming a correct diagnosis.

When the dropsical accumulation becomes very great, much uneasiness and general disturbance in the system arise from the mechanical irritation which it causes by its pressure on the organs and parietes of the abdomen. Respiration becomes short and anxious ; the stomach will admit of but small quantities of drink or food ; the fibres of the abdominal muscles yield, and the whole abdomen becomes sore and tender to the touch, and a dry and short cough generally comes on in the advanced stage of the disease. Ascites is very rarely wholly unconnected with anasarcous swellings. Ultimately, œdema of the feet and legs, if not more diffused cellular effusion, ensues. The urine is much more apt to be very high colored and sedimentous in ascites than in the other forms of dropsy. The bowels, too, are more torpid, especially in aggravated cases.

2. *Hydrothorax—Dropsy of the Chest.*

Hydrothorax generally supervenes gradually, without causing, in its initial period, any particular inconvenience or disturbance calculated to excite much attention or suspicion of the true nature of the malady. At length, however, the patient begins to experience a sense of oppression and tightness at the lower part of the sternum, with slight difficulty of breathing when at rest and in an erect posture. He now finds that, on lying down, or using active bodily exertion, especially on ascending an acclivity or stairs, the dyspnœa and sense of suffocation are greatly increased. When recumbent in bed, he raises his head and shoulders high by means of pillows, which, by diminishing the pressure of the effused fluid on the lungs, generally enables him to obtain some sleep. His sleep is, however, frequently interrupted by sudden and violent starts, and feelings of alarm and terror. The pulse is irregular and commonly very hard ; the thirst urgent ; the urine scanty, high-colored, and sedimentous. As the disease advances, the feet become œdematous ; the countenance is expressive of anxiety and alarm, and of a mixed pallid and livid aspect. There is generally a dry and short cough attending the disease, more especially when the patient lies down, or uses bodily exertion. All the foregoing symptoms increase, if the disease continues unchecked in its course, until the quantity of fluid in the chest is so great as to prevent the patient from lying down even for a moment, and obliges him to take his short and disturbed periods of sleep in a sitting or leaning posture. The extremities are generally cold, and more or less benumbed.

Of all the foregoing symptoms, the sudden starting during sleep is, according to Baglivi, the most certain pathognomonic symptom of this disease. Laennec, however, asserts that this symptom is sometimes absent ; yet, when it does occur, it may be viewed as a very strong evidence of the existence of thoracic effusion.

Hydrothorax may occur either as an idiopathic affection, or as one symptomatic of organic disease of some viscus of the chest or abdomen. The former variety of the disease is very rare. (Laennec.) By far the greater number of cases are of the latter kind. Organic cardiac disease is the most common source of symptomatic hydrothorax. Structural disorder of the liver and spleen may also give rise to the disease, and cases are recorded which appeared to have arisen from organic disease of the stomach. Chronic inflammation of the pleura, occurring as the *sequel of acute pleuritis*, is always attended with hydropic or sero-puruloid effusion into the chest. A tuberculous state of this membrane, and aneurismal dilatations and ossifications of the large vessels within the cavity of the chest, sometimes give rise to this malady. Besides these peculiar causes, hydrothorax may be produced by any of the general and particular causes mentioned above. Dr. Ayre observes, that a plethoric state of the system predisposes es-

pecially to serous effusion into the cavity of the chest; more particularly in persons who have passed the middle period of life, and who have indulged freely in the pleasures of the table. The correctness of this observation will be acknowledged by every one who has paid due attention to this subject. When this disease arises from some general cause, the effusion almost invariably occurs only in *one side* of the chest; but in those cases which come on in consequence of organic or structural disorder, the dropsical effusion, almost without exception, takes place at once in both sides of the thorax. (Laennec.)

Prognosis.—Idiopathic hydrothorax is not often a dangerous or unmanageable affection. Laennec says, that he considers the instances of death from the idiopathic variety of the disease, as rare as one in two thousand, when under the control of judicious remedial management. Indeed, even in the symptomatic variety of the disease, we may frequently succeed in removing the effused serum; but this seldom affords permanent relief, since we can but very rarely thus remove the organic disorder upon which the effusion depends, and which consequently still continues to take place, and give rise to further accumulation. Dr. Ayre asserts, what indeed I am well inclined to admit, that "the means which are sometimes used for the removal of the water in symptomatic hydrothorax, have now and then the effect, at the same time, of removing the organic disorder which gives rise to the effusion." Sir Henry Halford affirms, that he has ascertained from much experience, that if "the swelling in the feet or legs disappears without an increased discharge of urine, the patient generally dies very soon, and most frequently suddenly."* I have myself remarked this circumstance in several cases.

Diagnosis.—Ability to lie down only on the side affected, if the effusion has taken place only *in one side.* Percussion produces a very obscure and dull sound. The percussion should be made while the patient is in a sitting posture. General agitation, cough, and a sense of suffocation when firm pressure is made on the abdomen just below the ribs, so as to push up the viscera against the diaphragm. Inability to rest and sleep in a recumbent posture. If with these symptoms there are habitual cough; *starting during sleep;* tension and irregularity of the pulse; slight œdema of the feet, and of the integuments of the chest; great dyspnœa on ascending an acclivity or stairs, with a disposition to syncope, we may pronounce on the existence of an effused fluid in the cavity of the thorax with confidence. (Roux's edition of Desault's Surgery.)

3. *Anasarca—Cellular Dropsy.*

This form of dropsy consists in a morbid collection of serous fluid in the subcutaneous cellular tissue, and this accumulation may be either generally diffused throughout the whole body, or confined to a part of greater or less extent. The ordinary and most unequivocal sign, by which effusion into the cellular tissue is detected, is the pitting from firm pressure with the fingers. Anasarcous effusion commonly commences in the feet and legs, and thence rises up over the body with more or less rapidity. This, of all the forms of hydropic disease, is the most frequently connected with a sluggish and languid state of the system; and it is this form of the disease especially, which is apt to supervene on excessive losses of blood, and other exhausting or debilitating causes. The skin is exsanguious, and of a peculiar sallow or pallid cast; and the patient frequently manifests a great disposition to drowsiness, with a depressed or sluggish state of the intellect. Anasarca is often attended with some degree of abdominal effusion; and the latter, when it forms the primary affection, is rarely wholly free from anasarca. When anasarca arises from general causes, however, it is rarely connected with ascites. In nearly all instances in which these two forms of dropsy co-exist, the effusions into the internal cavities precede those into the cellular

* Transact. College of Phys. of London, 1820.

membrane. (Ayre.) Local anasarca may be produced by whatever impedes the free return of the blood by the veins. Hence, the gravid uterus, tight bandages, and the pressure of indurated glands in the groins, often give rise to œdema of the feet and legs by compressing, in some degree, the iliac veins. Mere debility, too, especially when aided by a long-continued erect posture, will have the same effect; and hence the frequency of œdema during the debility of convalescence from fevers. In nearly all organic diseases of the heart, œdema ultimately occurs in the feet and legs—more particularly in cases attended with ossification of the valves. Anasarca, from suppressed perspiration in consequence of the influence of cold, generally comes on and proceeds to its acme rapidly.

Prognosis.—This form of dropsy is not often attended with much danger when it occurs as an idiopathic affection—that is, without organic disease, and in consequence of some general remote cause, such as cold, arsenic, scarlatina, hemorrhage, &c. When unattended with abdominal or thoracic effusion, it is, upon the whole, much more frequently removed by remedial treatment than the other forms of dropsy. The more rapidly the disease supervenes, the more easy in general is its removal.

Causes.—Hemorrhages; suppressed perspiration from cold, particularly after scarlatina, or when the system is under the influence of mercury; the long-continued internal use of arsenic; intestinal irritation; great debility and exhaustion; repelled cutaneous eruptions; chronic gout; excessive and long-continued diarrhœa; indurations; organic disease of the kidneys, &c., are the most common causes of this variety of dropsy.

Treatment of Dropsy.

If the pathology which is laid down in the commencement of this chapter be correct, the principal indications to be pursued in the treatment of dropsy are, 1, to subdue the local sub-inflammatory or irritated action of the structures from which the dropsical exhalation takes place; and, 2, to promote the absorption and removal of the effused fluid. The first of these *general* indications is to be fulfilled—1, by diminishing the general momentum of the circulation where it is preternaturally great; and, 2, to drive the blood, as much as possible, from the capillaries immediately implicated in the morbid effusion, and to equalize the circulation. The second *general* indication is to be fulfilled—1, by promoting the activity of the various serous emunctories; 2, by diminishing the quantity of blood circulating in the venous extremities of the structure from which the dropsical fluid is poured; and, 3, by stimulating the activity of the absorbent system. One of the first and most important measures to be adopted in establishing an adequate derivation of blood from a part, is to diminish the general impetus of the circulation. In vain will we endeavor to diminish the preternatural afflux of blood to an irritated or inflamed part, if the *vis-à-tergo* of the circulation, or its general momentum, be suffered to remain undiminished. Whenever, therefore, the pulse is active, or tense and frequent, in dropsy, *blood-letting* is an all-important measure. By reducing the mass of the circulating fluid in such cases, we not only predispose the veins to absorb more rapidly, but we contribute, moreover, in a direct way, to the reduction of the process of effusion. I have known one or two efficient bleedings to cause an immediate and conspicuous amendment in the disease.* *Muscular* debility does not constitute any objection to blood-letting, provided the pulse be active, tense, or hard and frequent. The arterial system may be irritated to vigorous action, whilst the muscular system manifests a state of languor and debility. Of course, where the pulse is feeble and languid, venesection is uncalled for and improper. Having moderated the

* Dr. Hohnbaum has recorded a case of ascites, which, after paracentesis had been repeatedly performed, was removed by spontaneous epistaxis.—*Analen der Medizin.*, vol. iv. p. 226 of the *Sequel.*

momentum of the general circulation, where it was too great, considerable advantage may, in general, be obtained from local bleeding, by cups, or leeches, applied to the chest or abdomen, according as the effusion may have taken place in one or the other of these cavities.

Blisters, also, often assist materially in the successful treatment of *ascites* and *hydrothorax*. They tend in a direct way to derive the circulation from the irritated or congested serous membranes, from which the effusion occurs, and consequently to lessen the effusion, and promote the absorption of the dropsical fluid. In anasarca, or in any other forms of disease attended with anasarcous effusion, neither leeching, nor cupping, nor blisters, can be applied without some risk of gangrene, or mortification. Little or no peculiar advantage can, indeed, be expected from *local* abstractions of blood in anasarca, and the same observation applies to blistering. Dr. Ayre speaks very favorably of the effects of a *seton* fixed in the integuments of the chest in *hydrothorax*. In one instance of this form of dropsy, which came under my observation, much benefit appeared to result from this measure. I should prefer, however, resorting to blistering and cupping, as being decidedly more derivative and prompt in their influence than setons or issues. In ascites, leeching, followed by blistering or cupping, ought never to be neglected unless the anasarcous state of the surface be such as to render these measures hazardous.

Cathartics.—Drastic purgatives have, from the earliest periods of medicine, held a high rank among the remedial means employed in dropsy. They constitute, in fact, a very important class of remedies in this affection. Very active purgation not only often carries off the effused fluid, but in some instances has the effect of removing that morbid state of the peritoneal capillaries upon which abdominal dropsy depends. The efficacy of hydragogues is generally more conspicuous in *abdominal* dropsy than in the other varieties of this disease. Their influence upon the morbid condition of the peritoneum is much more direct and powerful, from its contiguity to the mucous membrane of the intestinal tube, than upon the more remote structures concerned in the other forms of dropsy. Though, in general, less beneficial in anasarca and in hydrothorax, cathartics are nevertheless frequently of considerable service even in these forms of dropsy; nay, in some instances, the effects of active purgation in removing dropsical fluids from the chest, are surprisingly prompt and complete.* Physicians have varied, and still differ in opinion as to the particular articles of this class of remedies best calculated to procure the desired advantages. It is, indeed, agreed, that those purgatives which are most apt to cause copious *watery* stools, or, as they are called, hydragogues, are decidedly the most efficient in diminishing dropsical accumulations; but there exists some diversity of sentiment in relation to the relative value of this variety of cathartics.

Cremor tartar may be placed at the head of this class of articles, in reference to hydropic affections. It is mild, cooling, and potent in its operation as a *hydragogue*, and possesses the additional and peculiar advantage of exciting, at the same time, considerable diuresis. Dr. Ferriar's statements afford strong testimony of its usefulness in abdominal and anasarcous dropsy. Out of forty-three cases treated chiefly with this remedy, thirty-three were cured—a result, which, however, has been but rarely obtained by other practitioners. In my own practice I have had unequivocal examples of the efficacy of a course of purgation with this article. I have for ten years past been in the habit of prescribing it according to the following formula, and as it appeared to me, generally with peculiar efficacy:

℞.—P. crem. tart. ℥iss.
— sulphat. potassæ ℥ss.
— scillæ maritim. ℥ii.
Tart. antimonii gr. ii.—M. S. A teaspoonful of this mixture is to be taken four or five times daily.

* Pring's Principles of Pathology, p. 262.

Given in this way, it has never failed, in my hands, to produce copious watery stools, together with a considerable flow of urine, and frequently diaphoresis.*

Elaterium is another valuable hydragogue in the treatment of dropsy. Dr. Ferriar asserts, that it surpasses all other articles of this kind, in the removal of dropsical accumulations; and it continues to be a favorite hydragogue with many of the most eminent practitioners of the present day. Dr. Clutterbuck, especially, attaches great value to this article, as a remedy in dropsy. I have employed it in a considerable number of cases of this disease, but it has not, in my hands, produced advantages equal to those I have derived from cremor tartar. Indeed, I have met with instances in which it did manifest harm, by the violent irritation it caused in the mucous membrane of the bowels. It must be constantly borne in mind, that although an *excitation* of the serous emunctories of the intestinal tube will in general afford advantage, yet when the effects of purgatives on the mucous membrane transcend this grade of excitement, and establish an *irritation*, bordering or actually passing into subacute inflammation, mischief must inevitably be the consequence. In prescribing such active purgatives, therefore, great care must be taken, lest in our anxiety to produce copious aqueous evacuations, we establish a morbid and permanent irritation in the mucous membrane of the bowels, and thus create a new and highly injurious focus of morbid sympathies in the system. Whenever such articles cease to produce copious watery stools, when given in ordinary doses, and leave a general sensation of soreness or tenderness in the abdomen, we are admonished to desist from their further employment.

Active cathartics will generally bring off copious watery stools for the first two or three times that they are administered; but by being again and again repeated, they will at last cease to excite the desired evacuations. A larger dose is then, perhaps, resorted to, but the stools will be still more incomplete and painful. Determined to overcome the supposed torpor of the bowels, the physician now prescribed a still more powerful dose, but instead of procuring free and watery evacuations, the patient will probably be harassed by small mucous stools, attended with great tormina or tenesmus. Thus mucous inflammation will be established in the intestinal tube, and a disease which, under a more judicious treatment, might perhaps have been removed, is rendered incurable.

Gamboge is also a favorite hydragogue with some practitioners; and I have myself employed it with much advantage. I have, however, always given it in union with *cremor tartar*, in the proportion of from two to four grains to a drachm of the latter article. It has appeared to me less apt to excite permanent irritation in the bowels than elaterium. Gamboge is the hydragogue which Dr. Ayre prefers. He gives it, as Dr. Ferriar did, to the amount of four or five grains at a dose, triturated with a few crystals of super-tartrate of potash. The gamboge rarely fails to cause copious watery stools. With regard to the frequency with which hydragogue remedies ought to be administered in the treatment of dropsy, we must be governed by the general strength of the system, and the particular effects resulting from their operation. When the strength of the patient will admit, the purgatives may be repeated every two or three days, provided they do not produce great tormina and soreness, and provided also that they cause free evacuations. I cannot but think, however, that the use of these remedies is frequently carried to an injurious extent in the present disease. Employed occasionally, and interchangeably with diuretics, they generally contribute materially to the reduction of hydropic affections, more especially of ascites and anasarca. But to exhibit them daily for a week and longer, must put the system to a severe

* This formula was first published by a German writer of the name of *Langhans*. I have known it to remove dropsical accumulations very speedily, after a great variety of diuretics and hydragogues had been used without much advantage. Dr. Charles Hildreth, of Marietta, (Ohio,) recommends the following hydragogue mixture: ℞.—Crem. tart. ʒij; Pulv. jalap ʒi; Nitrat. potassæ ʒi; P. gambogiæ grs. vi—M. Dose, one or two teaspoonfuls daily.—*Amer. Journ. of the Med. Sciences.*

trial, and even if the water be removed, frequently lay the foundation of much future suffering and infirmity.

Much praise has lately been given to the Caincæ root, (chiococca racemosa,) as a remedy in dropsy. It is said to operate powerfully as a hydragogue and diuretic, and some remarkable instances of its efficacy in dropsy have recently been published in the medical journals of Europe. This root has lately been imported into this country, and may be had in this city. The mode of employing it is as follows:

℞.—Rad. chiococcæ racemos. ℥ii.
Aq. bullient. lbiss.—M. To be boiled down to ℥viii. Of this a tablespoonful is to be taken three or four times daily.

Diuretics, of all our remedial means, are the most universally employed and relied on, in the treatment of dropsy. The kidneys appear to be the most direct and manageable outlet for dropsical effusions, and an important part of the treatment of this disease consists in exciting these emunctories to increased action. Observation has shown, that a full and phlogistic habit of body is much opposed to the free operation of diuretic remedies; and hence bleeding and purging in such a state of the system, are indispensable preliminary measures to the employment of remedies intended to promote the renal secretions. Equally difficult is it in general to procure the operation of diuretics in cases where the dropsical effusion is very extensive, and where the blood-vessels are drained of the serous portion of their contents. To obviate the difficulty which arises from this source, it will often be sufficient to allow the patient copious draughts of water, or of some other bland fluids. Dr. Cullen states that dropsies have been cured by the free use of diluent drinks, without any other remedies. I have known an instance of extensive anasarca cured, after a course of ineffectual treatment, solely by the free indulgence in eating water-melons. Much dispute has existed as to the propriety of allowing patients the free use of aqueous potations. It has been strenuously asserted by some, especially the older writers, that the plentiful use of drinks in this disease is decidedly prejudicial. Others, on the contrary, have maintained that this grateful indulgence is not only harmless, but often manifestly beneficial. Upon this subject, however, no universal rule can be laid down; for the fact appears to be, that in some instances, a liberal indulgence in the use of drinks is followed by unfavorable consequences; whilst in other cases, manifest benefit results from it. In all those instances of hydropic effusion which are the result of excessive hemorrhage, copious draughts of diluent drinks are, according to my own observations and views, decidedly detrimental. When the blood-vessels are suddenly deprived of a large portion of their contents by hemorrhage, their venous extremities absorb with great rapidity whatever aqueous fluid may be taken into the system. The blood-vessels will therefore soon be replenished, if much fluid be taken into the stomach; and as this circumstance, from the large proportion of crude watery fluid in the blood-vessels, must favor the dropsical effusion, as explained in the beginning of this chapter, injury can scarcely fail to result from the free use of diluents in such cases. The blood, in dropsies from hemorrhage, consists almost wholly of serum, the crassamentum being always exceedingly small; and the more drink there is taken in such cases, the longer will the morbid disproportion between these two constituents of the blood continue. Upon this point, Dr. Parry makes the following observations, which go directly to strengthen the above sentiments. "When dropsy is associated with large hemorrhages, it does not usually accompany them, but comes on after they have ceased; and I have concluded, that it is the effect of the fluids taken into the stomach being absorbed too suddenly for the relative state of the vessels, which therefore strive, if I may be allowed the expression, to get rid of it by every outlet." It appears to me manifest, therefore, that in such cases of dropsy, it will be advantageous to abstain as much from the use of drinks as the urgent thirst will admit. In instances arising from other causes, however, and in which the general diathesis

is manifesly phlogistic, a moderate indulgence in the use of mild beverages may be allowed with advantage. When, indeed, the thirst is great, and the blood sizy, diluent drinks may be regarded as decidedly remedial, and should be very freely taken.

Among the diuretics recommended in the treatment of dropsy, the following are the most important, viz., squill, digitalis, acetate of potash, nitrate of potash, cantharides, juniper berries, colchicum, spirit of turpentine, erigeron heterophyllum, and parsley.

Among these articles, the *squill* is the most frequently employed, and is, upon the whole, the most useful diuretic in the treatment of hydropic affections. It does not, however, appear to be equally beneficial in all the varieties of this disease; for where there exists much febrile reaction, and the general diathesis is decidedly phlogistic, its effects are rarely conspicuously salutary. In instances of dropsy, on the contrary, where the urine is scanty, high-colored, and sedimentous, with no very decided phlogistic habit of body, its powers are in general peculiarly beneficial. Almost all writers agree that squills are, generally, the best diuretic we possess in *hydrothorax*. Blackall, M'Lean, Ayre, and many other respectable writers on this subject, recommend this article as particularly calculated to do good in this variety of dropsy; and my own experience has furnished me with abundant evidence of the propriety of this recommendation.

The squill is commonly prescribed in union with other articles, and it would appear that its diuretic powers are frequently considerably enhanced by such combinations. Home thought that its diuretic effects were often much increased, by uniting with it some article calculated to promote its emetic powers; but Cullen strenuously opposed this opinion, and pointed out its erroneousness. Perhaps the best adjunct to squills is *calomel*—especially in the treatment of hydrothorax. I have been most satisfied with the triple compound of squills, nitrate of potash, and calomel, according to this formula:

℞.—Pulv. scillæ ℈i.
P. nitrat. potassæ ʒii.
Calomel gr. v.—M. Divide into ten equal parts. S. Give one every four hours.

The only objection which exists against this combination, is its tendency, in some instances, to produce gastric disorder; such as pain in the stomach, nausea, or vomiting. When effects of this kind occur, and the arterial system is not too much excited, one-fourth of a grain of opium should be added to this mixture. The addition of calomel to the squill, it may be again observed, is peculiarly valuable in *hydrothorax;* for, although this mercurial will frequently do much good in the other forms of dropsy, its tendency to increase diuresis, when given in this combination, is generally much more conspicuously displayed in the former variety of the disease. Dr. Blackall asserts, that squills act much more powerfully on the kidneys when given in as large doses as the stomach will bear without nausea, than when given in small portions. Dr. Ayre, on the other hand, recommends the exhibition of this article in small but frequent doses; and Richter is in favor of this mode of administering it. I prefer giving the squill, in doses of from one to two grains, every three or four hours, whether singly or in combination. The squill is also frequently given in combination with digitalis; and many add to this combination small doses of calomel. In anasarca from scarlatina or cold, digitalis may in general be very advantageously given in this manner.

The most serious objection to the employment of squill, is its aptitude to irritate and derange the digestive organs. Its tendency in this way is so considerable in some individuals, that it cannot be used at all. Indeed, some persons appear to have an idiosyncrasy against the influence of this article—rendering even small doses injurious. Besides the formula given above, I will add another one, which, in some instances, has, in my hands, produced copious discharges of urine.

℞.—Pulv. rad. scill. gr viii.
—— pip. nigr. gr. x.
P. nit. potass. gr. xviii.
Submuriat. hydr. gr. iv.
Pulv. opii gr. ii.

This (altered from Fordyce) is to be given once daily. I have found this combination particularly efficacious in cases attended with much languor and relaxation of the system. Richter mentions it as peculiarly useful in cases of this kind.

Digitalis is another valuable diuretic for the treatment of dropsy. The most opposite opinions, however, are expressed in relation to its powers in this disease. By many it is highly extolled; whilst some speak of it as of little or no essential value. The weight of good testimony is, nevertheless, decided in favor of its usefulness; although, generally, it is undoubtedly inferior to the squill, as a diuretic in hydropic affections. According to the observations of Withering and others, digitalis seldom does much good in persons of a robust habit and tense fibre. Its beneficial powers are most apt to be manifested in subjects of a relaxed and irritable habit of body. Dr. M'Lean entirely confirms this observation of Withering. He asserts, that he has seldom derived any particular advantage from this article, from persons of a corpulent habit and an irritable fibre; but in such as were of "a weak, delicate, irritable constitution, with a thin, smooth, and soft skin," he has generally succeeded well with this remedy. So far as my own experience enables me to judge, I am inclined to think, that there are good grounds for these observations. Dr. Blackall observes, that digitalis is our best remedy in those cases of dropsy which occur after scarlatina and measles; an observation which I believe to be well founded. I have known the diuretic effects of this article, in such cases, promptly efficient in removing the dropsical accumulation.

Digitalis would appear to be especially useful in those cases of dropsy that are attended with a very scanty secretion of urine, becoming turbid when cold, and coagulating when exposed to the heat of a lamp, and depositing a red sediment after standing for some hours. (Blackall.) When the urine of hydropic patients, though loaded with serum, is pale and crude, and rather abundant, digitalis, according to this writer, very seldom does any good. In such cases, he says, the squill is the best diuretic we possess. These observations deserve particular attention, in the selection of an appropriate diuretic: for, although they may not be universally, or perhaps even very generally, applicable, there is sufficient correctness in them, as a general guide, to afford considerable assistance in the adoption of our remedial means.

Digitalis is not often employed singly. The most common mode of prescribing it is in combination with squills. In cases attended with considerable febrile excitement, it may be very advantageously given in union with nitre. In very febrile habits, where there are much restlessness, spasmodic dyspnœa, and frequent and distressing urgency to void urine, I have known a combination of opium with digitalis to afford much relief. The addition of opium to this, or to whatever other diuretic may be used, is especially called for in cases attended with frequent and ineffectual efforts to evacuate the bowels, a condition which is sometimes superinduced by the inordinate use of drastic purgatives. Digitalis ought to be administered in substance; it has appeared to me to do most good, when given in small but frequent doses—that is from one-sixth to one-fourth of a grain, every hour or two, until its peculiar influence on the system is perceptible. In general this article is more effectual in removing anasarca than ascites, and ascites than hydrothorax. Many physicians are in the habit of prescribing it, in union with *calomel;* and there can be no doubt, that, under certain circumstances, this combination will act with peculiar advantage. Drs. Blackall and Paris, however, decidedly condemn this practice. Conceiving that the curative powers of digitalis, in dropsy, are dependent on its sedative effects, they main-

tain that calomel, being a stimulant of no inconsiderable powers, is incompatible, as a therapeutic agent, with the digitalis, and that it must necessarily tend rather to counteract than to promote the salutary influence of the latter. This objection appears to me hypothetical; and it certainly is frequently contradicted by experience. There is no good ground for believing that the diuretic effects of this article depend on its sedative powers; for the former effect is generally most conspicuously evinced when the action of the heart and arteries is least reduced; and, on the contrary, diuresis is sometimes entirely wanting, when the sedative influence of digitalis is the most conspicuous.

In general, the more phlogistic the diathesis, the more appropriate will this article be. In such cases, we may employ it with the twofold intention of exciting an increased flow of urine, and of moderating the general vascular irritation.

Cantharides have been employed with no inconsiderable degree of success in the treatment of dropsy.* Where the general habit is weak and sluggish, and especially, where the disease is connected with an original torpor of the kidneys, this article sometimes excites copious diuresis. Hufeland recommends this formula for administering the cantharides in dropsy:

℞.—Pulv. canthar. ℈ii.
Amyg. dulc. ʒi.
Sacch. alb. ʒiss.—M.

Rub them together in a mortar, and make an emulsion, by adding gradually ten ounces of warm water. Of this a tablespoonful is to be taken every two or three hours, until symptoms of strangury supervene. I have known this mixture to reduce anasarca from suppressed menses, very speedily. It appears to be particularly adapted to cases arising from suppressed cutaneous affections.—(Richter.)

Colchicum autumnale has not, hitherto, been much employed in the treatment of dropsy; its powers, however, deserve more attention in this respect than it appears as yet to have obtained. I have derived great benefit from this medicine in a case of anasarca, apparently the consequence of a gouty habit; and I am disposed to place considerable reliance on it in all cases attended with a rheumatic or gouty diathesis. I have found it most efficacious as a diuretic, when given in union with the sulphate of potash. In the case just alluded to, I gave forty drops of the vinous tincture, with a scruple of the powdered sulphate of potash, every six hours.

The *nitrate of potash* has been much employed, and occasionally with the happiest effects, in hydropic diseases. It is usually given in combination with other articles—particularly squills and digitalis. I have employed it by itself, with much benefit, in a few cases of ascites. It will rarely do any good in hydrothorax. From its known antiphlogistic powers, it is manifestly only in cases characterized by a phlogistic habit of body, that any particular advantages can be looked for. When the pulse is small, corded, and irritated, nitre and *opium* in combination, frequently do much good. From fifteen to twenty grains of the former, with one-fourth to half a grain of the latter, may be given every three hours. I have known this combination to render the pulse soft and expanded, the skin moist, and the urine copious.

There are a number of other diuretic remedies, all of which have been used with more or less of success in the treatment of dropsies. It is by no means uncommon to succeed in removing dropsical accumulations through the renal emunctories, by some simple diuretic article, after the more powerful and esteemed remedies of this kind have been tried without success. I have known the infusion of the erigeron heterophyllum to bring on copious diuresis, and to reduce dropsical swellings speedily, after the remedies already mentioned had been given unsuccessfully. This is, indeed, an article which merits no small degree of

* *Prispane's* Select Cases. *Chalmers* on the Diseases of South Carolina. *Robertson's* Treatise on the Power of Cantharides used internally. Edinb., 1836.

attention as a diuretic, in this disease. It may be conveniently employed as a ptisan, along with the squill, digitalis, or some other more powerful article. The infusion of the seed of *daucus carota*, too, is an excellent diuretic, and has been a good deal employed by the practitioners of this country. Of a similar character are *juniper berries*, *lactuca virosa*, *galium aparine*, horseradish, and a number of other diuretic vegetables employed as domestic remedies, and occasionally also in regular practice. Of the usefulness of the *galium*, I can speak from experience. I knew an instance, where a strong infusion of this vegetable removed a long-standing case of abdominal dropsy in a very short time. Whatever remedies may be prescribed, the concomitant use of some one of these ptisans will generally contribute, more or less, to the success of the treatment. When the stomach will bear it, the erigeron will, in general, answer better than any of the other articles just mentioned. This was a favorite medicine with the late Dr. Wistar. It is well to have a variety of diuretics at hand, in the treatment of dropsy; for, in some instances, a number of the most active medicines of this kind will be used without the least perceptible action on the kidneys, and yet, at last, there will be some one found which will speedily produce copious diuresis. It is a good rule to vary the prescription, if, after a reasonable time, and proper auxiliary measures, the desired effect does not ensue.*

Diaphoretics are mentioned by Celsus as among our best means for the cure of dropsy. We can very rarely procure the full operation of diuretics, so long as the skin remains uniformly dry and harsh. The union, therefore, of antimonials with diuretics, will, in instances of a decidedly phlogistic character, often assist materially in removing dropsical accumulations. Sydenham appears to have placed very considerable reliance on the employment of antimony in this affection, although his principal object in prescribing it was the production of active vomiting—an effect which sometimes procures the speedy absorption and removal of dropsical accumulations from the abdomen and cellular tissue. I have never myself employed antimony with this view: but as a diaphoretic, I have known it to produce very happy effects. In those cases of anasarca and ascites, which occur in consequence of suppressed perspiration from cold when the system is under the influence of mercury, or after an acute cutaneous disease, I know of no remedy which will more certainly procure relief than antimony, given in minute and frequently repeated doses. I have also known it speedily successful in a case of anasarca from a protracted intermittent. In general, wherever the exciting cause of the disease is cold, or connected immediately with torpor of the cutaneous exhalents, antimony ought not to be neglected as a means of relief. I have always given it dissolved in a large proportion of some diaphoretic beverage —such as infusions of juniper-berries, wild carrot seed, parsley, or erigeron. One grain may be dissolved in a pint of any of these ptisans, and drank *ad libitum*, during the day, so that at least one, and, if convenient, two pints may be taken in this space of time. Munro speaks favorably of a combination of antimony and opium: when the disease is attended with a rheumatic habit, this mixture is often especially beneficial. It must not be forgotten, however, that very profuse perspiration and diuresis are incompatible; all that is requisite, in

* Dropsy is a disease by no means so uniform in its character as is generally supposed. It arises from a great variety of remote causes—in the most opposite states of the system, with regard to vascular action and repletion—it is dependent on various organic affections; appears as a consequence of different acute and chronic affections, and is attended with divers and distinct characters of the urinary secretion. These circumstances point out much diversity in the general character of the disease itself, and it is not reasonable to suppose that any one particular diuretic is equally applicable to the disease under all these diversities of general character. When, moreover, we take into view the diversities of constitutional habit—of idiosyncrasy—and the ever-varying state of the organic functions—we can readily conceive, that out of a great number of diuretics, there might not be more than one which is calculated, in a particular instance, to excite the action of the kidneys. It is, therefore, a good rule to vary the prescription, if, after a reasonable time, and proper adjuvant measures, the desired effect does not follow.

relation to the action of the skin, when we continue to act on the kidneys, is to render it soft, relaxed, and moderately moist.

In those cases of anasarca in which the skin is cold and very dry, with a sluggish action of the pulse, the *black sulphuret* of iron is a medicine of excellent powers. Dr. Archer, of Norfolk, has reported an interesting case which was speedily cured by this remedy. It is also mentioned by Alibert* as an excellent medicine in anasarca attended with great relaxation and weakness. I have had occasion to prescribe it in two instances of this kind—both the consequence of immoderate lochia, and great previous debility; and the results were highly gratifying. This article generally excites a glow of warmth throughout the whole body, attended with a peculiar tingling sensation in the extremities; and, in most instances, a profuse perspiration ensues a few hours after it is taken. Besides its diaphoretic effects, it is also peculiarly calculated to do good in such cases by its tendency to invigorate the assimilating functions. I am not aware that any advantages are to be obtained from this article in any other cases than such as proceed from excessive hemorrhages, or other exhausting and relaxing causes. Diaphoretics are in general decidedly useful only in anasarcous dropsy. Among the ancient Romans, it was customary to excite sweating in this disease, by burying the body up to the neck in warm sand;† and I may here also mention the use of oiled silk, which, when closely applied over the surface of the body, generally excites a considerable perspiration. This application is particularly useful in local dropsical effusions into the cellular tissue.‡

Emetics have by some been highly extolled for their power of removing dropsical accumulations. I have already mentioned Sydenham as an advocate for their employment in this disease; and I may add the authority of Richter, Lentin, Cruikshank, and Pinot in their favor. I knew an instance of ascites which was removed by spontaneous and protracted vomiting; but I have never yet prescribed remedies with a view to their *emetic* operation in this disease.

Mercury is a favorite remedy with many of the American physicians in the treatment of dropsy; and there can be no question as to its utility in certain modifications of the disease. In cases depending on hepatic and splenic disorder, it constitutes our main stay; and in the treatment of *hydrothorax* it is generally highly beneficial. In instances which occur in consequence of excessive hemorrhage, or other exhausting causes, and in subjects of a scorbutic or depraved habit of body, mercury cannot be employed with propriety. Some degree of firmness of the general habit may be regarded as the most favorable for the exhibition of mercury, with a view to its constitutional influence. (Blackall, M'Lean.) A decidedly inflammatory condition of the system, however, is opposed to the beneficial influence of mercury in this disease; and where such a diathesis is conspicuous, antiphlogistic measures must precede its employment. *Calomel* is the preparation usually prescribed in dropsy. As a general rule, mercurialization should not be carried beyond the extent of producing only a slight soreness of the gums; profuse ptyalism being not only unnecessary to procure the peculiar advantages of this remedy, but sometimes, perhaps generally, injurious in its consequences, more especially in anasarca. This article, as has already been stated, is almost always given in combination with some diuretic, particularly squills and digitalis.

In ascites, much benefit may sometimes be derived from mercurial frictions on the abdomen. From some cases which have been recently published, it appears that subacute inflammation of the peritoneum often yields to mercurial frictions, without scarcely any aid from other means. Laennec has cured cases of effusion into the abdomen by this application after a variety of other remedies, usually relied on, had been employed without benefit.§

Tonics were, at one time, much employed in dropsy. The disease was sup-

* Elémens de Thérapeutique, tom. i. p. 180.
† Celsus, De Medicina, lib. iii. cap. xxx.
‡ Richter, Specielle Thérapie, vol. iii. p. 59.
§ Revue Médicale, Mai 1824.

posed to depend chiefly on debility and relaxation, and every effort was, accordingly, made to invigorate the system. In general, this class of remedies is not only useless but injurious. Occasionally instances are met with, in which tonic remedies produce very good effects. Where the general debility and languor are very great, and the pulse feeble and sluggish, bark, iron, particularly the muriated tincture, and the vegetable bitters, may perhaps be used with advantage. *Gum kino*, in large doses, cured a case, after various other remedies had been used without benefit.* The *sulphate of copper* has been frequently given with complete success in cases of dropsy attended with great vascular debility. Gardane, Chalmers, and Wright mention successful instances of this kind. This remedy has been generally given in combination with opium, in doses of a grain of each three times daily.

Several German physicians have recently employed the *muriate of gold* in ascites and anasarca with peculiar success. Dr. Wendt states that he prescribed it in eight cases, in the hospital at Breslau, seven of which yielded entirely to its influence.† This article often manifests decided diuretic powers; and, as it is also an excellent alterative, resembling in this respect mercury, it may probably be particularly suitable in cases connected with a depraved habit of body from the abuse of mercury, syphilitic taint, or an arthritic diathesis.

It were, indeed, almost an endless task to give an account of all the remedies which, under peculiar circumstances, have removed dropsical accumulations. The following are the principal articles of this kind. Ipecacuanha, Dover's powder, helleborus niger, pilulæ hydragogæ janini, radix sambuci, the fixed alkalies,‡ millepedes, lactuca virosa, garlic, scandix cerefolium, apium graveolens, onions, iris palustris, sorbus acuparia, balsam copaiva, turpentine, olive oil, *opium*,§ *apocynum cannabinum*, pipsissewa, trifolium fibrinum, camphor, and asparagus. Dr. Laurie has published cases which tend to show that the internal use of *nitric acid* is often very efficacious in those forms of dropsy which succeed to acute febrile diseases.‖

The external application of diuretic agents has of late years been employed with considerable success in this disease, by some of the French physicians. It would appear from the accounts which have been published, that the kidneys may often be as actively excited by diuretics applied in frictions to the surface of the body as when taken internally. Where the stomach is weak and irritable, a condition so peculiarly opposed to the regular operation of diuretics, the external mode of using them, if, in truth, their remedial influence may be thus fully obtained, would be decidedly preferable. I have seen but one instance of this disease, in which the production of diuresis was attempted in this way, and this case afforded me sufficient evidence that *some* advantage, at least, may be obtained from frictions on the abdomen, with diuretic remedies. In a recent number of the *Revue Médicale*,¶ there are four cases of thoracic and abdominal dropsy recorded, which were successfully treated upon the *iatraleptic* plan. The author,

* Medico-Chirurg. Review, July 1827.

† Rust's Magazine, b. xxv.

‡ The alkalies are sometimes decidedly beneficial. Monro, Pringle, Mead, and Fallot, speak of them in terms of encomium, as remedies in dropsy. They are said to be particularly applicable in cases attended with great atony. They have been generally given in union with vegetable bitters. I attended an old lady, during the present year (1828), affected with ascites and anasarca of the inferior extremities, in whom I found no remedy so useful as the salt of tartar in union with the expressed juice of *tansy*. She took ten grains of the alkali with a tablespoonful of the juice, thrice daily. The celebrated Frank thought highly of the powers of the alkalies in dropsy. His formula is—

℞.—Kali. carbon. ℔j.
Herbæ absinth. ℥i.
Infunde c. vin. rhen. ℔j. Digere per xxiv. horas cola. Dose, one ounce every four hours.

§ I have prescribed opium in a case attended with a rheumatic habit with unequivocal benefit.

‖ Analen der Medizin, vol. iv. p. 266.

¶ Septembre 1828, p. 349.

Dr. Guibert, directed frictions on the chest, or the abdomen, or the thighs, according to the form of dropsy present, with the following fluid:

℞.—Tinctura scilla.
——— digitalis.
——— sem. colchic., āā ℥ss.
Ol. camphorat. ℥iss.—M.

The frictions to be made with flannel three or four times daily, and continued from five to twenty minutes. Concomitantly with this external application he ordered a diuretic mixture to be taken internally, composed of squills, digitalis, and nitrate of potash in equal quantities, and a somewhat larger portion of *thridace*, in doses of two grains and a half of the mixture twice daily. "The iatraleptic method of treating dropsy," says Dr. G., "has appeared to me particularly efficacious in abdominal dropsy; and it is chiefly to the external employment of the above diuretic liniment, that I think myself warranted to ascribe the success which attended my efforts in the above cases. The internal remedies which I employed at the same time, seemed to me very useful auxiliary measures, but they could not, I am persuaded, have by themselves produced the very copious urinary discharges, resembling almost complete diabetes, which occurred in these cases under this treatment. In all these cases, and I might adduce others equally remarkable, the dropsical swellings were reduced with surprising rapidity. The iatraleptic mode of treating this disease is attended with little or no inconvenience to the patient. It should not, however, be adopted until the phlogistic state of the system is reduced by appropriate antiphlogistic means. In idiopathic ascites and anasarca, this mode of treatment will succeed almost without exception.

Dr. Thomas Short,* of Edinburgh, has recently employed the marchantia hemispherica, as an external application in the form of cataplasm, with marked success in hydropic affections. Applied in this way, it often acts strongly as a diuretic. "In many cases," says Dr Short, "it has been astonishingly successful, but it has, like other diuretics, failed. I cannot say that I have ever known the slightest benefit derived from its internal use, although I have frequently administered it in the form of decoctions. Employed externally in the form of poultice, however, I consider it as a remedy of great value. The poultice is prepared by carefully picking and washing about two large handfuls of the leaves; these are thrown into a pot containing about a quart of boiling water, and simmered by the side of a fire for twelve hours, adding fresh water if required. It is then beat into a pulp, and as much linseed meal stirred in as to bring it to the consistence of a poultice, which is spread on flannel and applied to the abdomen (in ascites), and fastened with a pretty tight bandage—or it may be applied to the legs, if anasarca of the extremities alone exists. The poultice should be renewed every twelve hours. This poultice produces, in general, copious perspiration, and, at the same time, acts powerfully on the kidneys. In some constitutions it occasions feelings of great sinking and exhaustion, but I have never known it to do harm. A few small doses of the *spirit. æther. nitros.* will, in general, soon remove this unpleasant sensation. The effects of this application are increased by the patient's drinking plentifully of warm fluids, and I have always preferred weak beef-tea or chicken-broth with the view of keeping up the strength. Opiates of all kinds I have found hurtful; but I employ warm clothing, and keep the patient in bed, during the whole period in which the poultice is applied."†

Among the external means which may be resorted to with occasional advantage in ascites, a tight flannel bandage worn around the abdomen will frequently prove decidedly beneficial. This application was much extolled by the late Dr.

* Edinb. Med. and Surg. Journ., vol. xxxix. p. 129.

† The *marchantia hemispherica*, commonly called *liverwort*, grows abundantly in certain localities of the eastern and middle states of this country. It is a lichen, consisting of membranous expansions, cut into rounded lobes, with entire edges, of a bright green color on the upper surface, and a slightly purplish hue on the under side. It is usually found in moist and shady places, on the banks of rivers, and on rocks, and is to be met with at all seasons of the year, but is supposed to be in the greatest vigor about the end of August.

Monro, in the treatment of abdominal dropsy. I have repeatedly found such a bandage of advantage, particularly after the dropsical swellings had been in part removed, but continued stationary for some period. The effects of the bandage will be increased, if previously soaked in a strong solution of salt, and dried again before it is applied. Would not the powers of such a bandage be still more enhanced, by imbuing it with a strong infusion of squills, or of some other active diuretic?

After all, our efforts to prevent or remove dropsical effusions are but too frequently foiled; and it becomes necessary, in order to prolong the life of the patient, and to gain more time for remedial applications, to evacuate the collected fluid by means of a puncture into the cavity which confines it.* It is usual to delay this operation until every other measure for the removal of the fluid has been found unavailing, and the distension from the effused water has become so great as to threaten immediate danger. This is one of those errors in medical practice, which, though readily and generally acknowledged by practitioners, it is extremely difficult to correct, on account of the great dread which all surgical operations, and especially such as penetrate into the large cavities, are so apt to excite in patients. Being, moreover, universally viewed as the *last resource*, and only for a temporary procrastination of the fatal conclusion, few are willing to submit to the operation until all other means for removing the water have been tried. Without doubt, however, tapping is by far the most direct and certain means for removing dropsical accumulations, and it is as safe in its consequences as any of the other measures that may be adopted for this purpose. Were tapping more early resorted to in ascites than it always is, there can be but little doubt, that its permanent usefulness would be greatly enhanced. The mere mechanical irritation of the effused fluid, when the distension is very great, must tend to keep up that morbid condition in the peritoneum which gives rise to the effusion. The earlier this over-distension is taken off, the greater, one may reasonably presume, must be the chance of effecting a radical cure, by some of the means already mentioned—more especially by local bleeding, blistering, mercury, and frictions. Indeed, the operation is by no means simply palliative in its consequences. There are many cases on record which were perfectly cured, solely by removing the water by an operation. Frank, Lentin, Richter, Desault, Fothergill, and others, relate cases of this kind; and there is reason to presume, that if tapping were not so commonly delayed until the disease has assumed an inveterate character, such fortunate terminations would be much more frequent than they are under the present plan of procrastinating it.†

* It is truly surprising what large quantities of water are sometimes drawn in the aggregate, in cases of abdominal dropsy. M. Lecourt de Cantilly has related an instance in which the operation of tapping was performed one hundred and thirty-five times in the course of six years, and by which the aggregate amount of two thousand seven hundred pounds of water was drawn off. Mead mentions a case (*monita*) in which tapping was performed seventy times in five years and seven months, which yielded one thousand nine hundred pounds of water. M. Louyer Villermay relates an instance where tapping was undergone five hundred times, the patient having finally tapped himself.—*Revue Médicale*, Juillet 1828.

† M. Lhomme, in January 1827, communicated to the French *Royal Academy of Medicine* an inveterate case of ascites, which, after hydragogues, diuretics, and tapping, had been fully but unavailingly employed, was speedily cured by the injection of the vapor of wine into the cavity of the abdomen through an orifice made with a trochar. He was led to the employment of this *anceps remedium*, by having read in the *Annales de la Médecine Physiologique*, an account of two cases of abdominal dropsy which were cured by the same means. The vapor of wine was injected sixteen times without causing any pain or particular uneasiness in the abdomen, with the exception of some slight colic pains which required no remedial attention. At the time of reporting the case, two years had already elapsed from the period at which the injection was made and the malady arrested. M. Lhomme tried the same means in another case, but without success. No unpleasant consequences, however, resulted from the operation. It is *not* difficult to conceive how such a measure might put a stop to dropsical effusion, if a state of chronic inflammation of the peritoneum be its cause. It is well known that stimulating applications are generally the only means effectual in removing inflammations of a low or languid grade of excitement. We thus remove gleet, chronic ophthalmia, and chronic bronchitis, by stimulating injections, collyria, and inhalations of the vapor of tar.—*Revue Médicale*, vol. i. p. 343.

CHAPTER IX.

CHRONIC AFFECTIONS OF THE LYMPHATIC SYSTEM.

SECT. I.—*Scrofula.*

SCROFULA appears in a great variety of forms and grades of violence—varying from the slightest habitual deviations from health, to the most distressing, rapid, and fatal forms of local and general disease. In a general way, scrofula may be divided into two distinct forms; namely, its *latent* and its *active* states. The former constitutes what is usually called the *scrofulous habit* or diathesis; and the latter, the state of full development and activity of the disease.

The *scrofulous habit*, or predisposition to the active forms of the malady, is characterized by the following phenomena: a peculiar delicacy and languor of the countenance, with a soft, rosy tint of the prolabia and cheeks;* or a pale, soft, flaccid, and apparently tumid aspect of the countenance, with a dull lead-colored circle round the mouth, and a swollen appearance of the upper lip. The hair is generally fair, and the eyes blue or black. The head, particularly the posterior part, is usually large, and the temples flattened, or somewhat depressed. There is, in general, a great proneness to slight catarrhal affections, during which the wings of the nose and upper lip are apt to become swollen. The edges of the eyelids are much disposed to become inflamed, and where the scrofulous tendency is strongly developed, the tarsi are almost constantly red and tender. The digestive powers are usually weak and irregular, and the bowels are apt to be either constipated, or affected with painful mucous diarrhœa. The appetite, also, is very variable—being sometimes entirely depressed, and at others very urgent. The urine commonly deposits a whitish sediment, and becomes turbid some time after it is passed. A disposition to transient swellings of particular parts, as of the face and scrotum, is mentioned by some writers as belonging to this habit. In female children, a leucorrhœal discharge is apt to occur from time to time; and in very young children, excoriations behind the ears, scabby eruptions about the head and lips, obstinate ophthalmia, together with a fretful and irritable temper, are among the most common phenomena attending the scrofulous diathesis. The growth of the body usually proceeds slowly: but the mental powers are generally precociously developed, and often astonishingly active. This dormant or inactive state of the disease may continue for many years, and at last pass off without terminating in any particular local affections. More commonly, however, the scrofulous habit gradually requires strength, and at last, under the influence of the usual exciting causes, shows itself in its more obvious and active form.

The lymphatic glands along the neck and other parts become enlarged and firm to the touch, in which condition they may remain for years, without either receding or going on to a more active form of disease. In general, however, they pass by degrees into slow inflammation, which at last terminates in suppuration or scirrhus. When they suppurate, which is by far the most common mode of termination, they form chronic indolent ulcers, from which a thin, milky, and somewhat viscid fluid is copiously discharged, and which are always extremely

* This appearance of the countenance is particularly met with in those instances of a scrofulous habit, in which a particular tendency to phthisis pulmonalis exists. Mr. Lloyd, however, asserts that there are no just grounds for regarding the white and rosy cheek, the flaxen hair, and azure eyes, as marks indicative of the scrofulous habit.

slow in cicatrizing. The cicatrices left by these ulcerations, are, in general, easily distinguished from those left by other ulcers. They are peculiarly uneven, irregular, and conspicuous. In connection with these tumors, or ulcerations about the neck, the eyelids and conjunctiva are very apt to become affected with obstinate inflammation; and, in some instances, much irritation occurs in the mucous membrane of the nose and bronchia. In a more advanced state of the disease, the salivary and thyroid glands, as well as the pancreas and other internal glandular parts, become enlarged and indurated. Scabby eruptions appear on different parts of the surface; the extremities of the long bones enlarge; ulcerations occur in the cartilaginous structures; some of the bones become carious; the large joints inflame and suppurate; in some instances the vertebræ become diseased; and occasionally the bones and soft parts of the nose, palate, and fauces, are more or less rapidly destroyed by ulceration. There is, in short, scarcely any part of the body which is not sometimes the seat of the frightful ravages of this affection.

The most common forms of scrofula, however, are *tubercular phthisis pulmonalis; white swelling*, or disease of the hip and knee joints, and *ophthalmia*.

The general progress and duration of scrofula are exceedingly various. In some cases it is developed in infancy, whilst in others the constitutional tendency to the disease remains dormant until the age of puberty, or until a period much later, before it manifests itself in an active state. Some individuals are more or less affected with scrofulous disease of the lymphatic glands during the greater period of a long life, without experiencing any particular sufferings from this source. Much more commonly, however, some one or more of the distressing and fatal consequences already mentioned, ensue before the age of manhood. Although scrofula is vastly more common during childhood than at any other period of life, yet the occurrence of decided scrofulous affections in new-born infants is an exceedingly rare phenomenon. Mr. Lloyd, nevertheless, states, that he found the lungs of an eight months fœtus tuberculous—the mother having died of phthisis pulmonalis; and a few similar instances may be collected from writers on this subject. The manifestations of the scrofulous habit seldom make their appearance before dentition commences.

Causes.—Scrofula, or rather an especial predisposition to this disease, is one of those constitutional habits or tendencies, which often occur in children as an *hereditary* diathesis. This, however, is by no means the only source of the scrofulous habit; for that it may be *generated* in individuals originally of sound constitutions, and born of parents perfectly healthy in this respect, by various external influences, admits of no doubt. The causes which are acknowledged to be most frequently and actively concerned in the production of a *predisposition* to this disease, are—

1. *Climate and atmospheric influences.* It would appear that the influence of *hot climates*, in infancy and early youth, has a considerable tendency to predispose the system to the occurrence of the scrofulous diathesis, from the subsequent influence of a cold and variable, and damp atmosphere. Scrofula is a very uncommon disease in the East and West Indies; but when the children of Europeans, born in these climates, or even the natives, are brought to reside in the variable climates of Europe and this country, they are in general particularly liable to suffer more or less from scrofulous affections. "We know at least," says Dr. Alison, "that a great majority of the inhabitants of the West and East Indies, both negroes and Hindoos, are unusually prone to scrofula when they come to temperate climates."* A cold, humid, and variable atmosphere, more especially when aided by deficient and unwholesome nourishment, appears to have a strong tendency to favor the development of the scrofulous habit. It is from this cause, probably, that in the deep and narrow valleys of Switzerland and Savoy, in which the atmosphere is very variable and humid, certain forms

* Observations on the Pathology of Scrofulous Diseases, &c., p. 397.

of scrofula are so very common. In Holland, and in some of the marshy districts of England, this disease is said to be peculiarly prevalent.

2. The *impure and confined air* of populous cities also seems particularly capable of promoting the occurrence of scrofulous diseases. It is certain, at least, that in the same amount of population, this malady is vastly more common in large and crowded cities than in the salubrious districts of the country. "It is notorious," says Dr. Gregory, "that the population of our large manufacturing towns—Manchester, for instance—pent up during the day in cotton mills, are of all others most affected with it."

3. *Deficient and unwholesome food*, with the usual attendants, squalidness and mental depression, may contribute to the production of the scrofulous diathesis. Without doubt, however, coarse, indigestible, and irritating articles of diet, when habitually and freely used by young children, have a much more decided tendency to produce this affection, than mere deficient or innutritious aliment. An improper dietetic management of very young children, in relation both to quantity and quality, is probably one of the most common sources of scrofulous affections. By over-distension of the stomach, or the use of heavy, irritating or indigestible food, dyspepsia and high irritation of the gastro-intestinal mucous membrane will seldom fail to supervene; and as this condition of the stomach and bowels is usually attended with a morbid appetite, more food is habitually taken into the stomach than can be digested, and the gastro-intestinal irritation is thus kept up, until the chylopoietic and assimilating functions, and indeed the whole system, become intimately deranged. Nothing is more common than to meet in children, who have been mismanaged in this way, and who are almost constantly eating from morning till night, glandular swellings along the neck, and scabby eruptions on the head and face, with tense and tumid abdomens, and other symptoms of gastro-intestinal disorder, where, from the health of the parents, no hereditary taint can be presumed to exist. *Chronic inflammation or habitual irritation of the mucous membrane of the stomach and bowels*, is probably much more frequently concerned in the formation of the scrofulous habit, than seems to be generally supposed. There are few children long affected with what is usually called *marasmus*, who do not subsequently manifest a predisposition to scrofulous affections.

4. *Various diseases* possess a tendency to give rise to the scrofulous diathesis. This is especially the case with measles, scarlatina, and whooping-cough; but it would seem that it is rather by the influence of cold, and errors of diet, during the stage of convalescence from these diseases, that the scrofulous habit is generated, than by any direct tendency in these affections to develop this diathesis. Without specifying any more causes of this kind, however, we may observe, in a general way, that whatever tends *permanently to derange the digestive powers*, and to debilitate the general system during infancy and childhood, is calculated to engender a predisposition to scrofula.

My own observations, though limited in relation to this disease, have led me to the conviction, that disorder of the digestive organs, from whatever cause it may arise, often constitutes the principal source of scrofulous symptoms. Upon this point, the observations of Dr. Carmichael appear to me to possess much interest and value. "I have adduced," he says, "incontrovertible facts, which demonstrate that disorder of the chylopoietic viscera precedes and accompanies the symptoms of scrofula, and that there are the strongest grounds for believing that such disorder is, in a very great majority of cases, the immediate cause of the disease. A defective digestion, continued for any length of time, must as certainly produce chyle or blood of a vitiated quality, and unfit to replenish the waste of the body, as the constant use of unwholesome food. A disordered state of the system first ensues, and is followed by various local complaints. It is highly probable, however, the *gastro-intestinal irritation*, which always attends, in a greater or less degree, where the digestive functions continue long in a disordered condition, contributes as much, and perhaps much more, to the produc-

tion of the scrofulous symptoms in such cases, than the vitiated chyle which is prepared by the stomach."*

It need scarcely be observed, that where there exists an hereditary or natural predisposition to scrofula, the foregoing causes have an especial tendency to excite it into a state of activity; for it is sufficiently obvious, that whatever is capable of *originating* the peculiar diathesis in question, will be still more apt to call it into action where it already exists.

Scrofula cannot be communicated by inoculation, or in the manner of a contagion. Hufeland inoculated healthy children with matter taken from mild scrofulous ulcers, without the least perceptible consequences on the health of the inoculated individuals.† Mere local ulcers or scabby affections have, indeed, been known to occur from the frequent application of the matter discharged by ulcerations of this kind. Thus, healthy children who sleep with persons affected with scrofulous scabby eruptions about the head, will sometimes become affected with similar disorders. But these do not possess the character of true scrofula.

Pathologists have expressed a variety of opinions in relation to the essential nature of the scrofulous diathesis; but the most plausible doctrine upon this point is, that the scrofulous habit consists in constitutional or acquired excess of irritability in the lymphatic system, in connection with a weak condition of the assimilative powers.

Prognosis.—Where the predisposition is hereditary, the chance of subduing scrofula, after it has manifested itself in an active form, is always extremely small. Nevertheless, it is a fact well established, that even where the diathesis is manifestly congenital, moderate cases of the disease not unfrequently disappear entirely about the age of puberty, or after the corporeal development is completed, and the age of manhood has arrived. It must be observed, however, that these epochs in the physical development of the system are much more frequently attended with results of a very contrary character; for it is precisely at these stages of life that the scrofulous habit is most apt to pass from a latent to an active state. Similar observations apply to the effects of acute general diseases. Severe febrile affections have been known to remove incipient scrofula, in habits obviously predisposed to the disease, but, as has been already stated, it is vastly more common to find the disease more or less rapidly developed by violent febrile affections—more especially measles, scarlatina and small-pox. In some instances, the disease slowly continues to develop itself, until the stage of puberty or manhood has arrived, when it remains stationary during the subsequent period of life. In forming a prognosis as to the probability of effecting a cure, or of a spontaneous subsidence of scrofula, particular regard must be had to the following circumstances.

1. *The nature of the predisposing and exciting causes.* Where a number of causes of this kind co-operate in the production of the disease, and especially where the situation and circumstances of the patient are such as to render an entire removal of them impracticable, the chances of advantage from remedial management must, of course, be exceedingly limited. Among the poor and squalid, who can neither procure proper nourishment, nor protect themselves against the injurious influences of cold, it is next to impossible to effect a cure, when the disease shows itself in an active form. I have already stated the greater difficulty of removing hereditary scrofula than those cases which arise from external influences. 2. *The age of the patient and the duration of the malady.* The younger the patient is, the more easy, in general, will it be to remove, or effectually counteract, the progress of the disease. When the disease makes its first *active* appearance after the age of puberty or of manhood, the chances of being able to suspend its progress are but small, and still less to remove the symptoms altogether. 3. *The degree of violence of the disease.* So long as

* Carmichael on the Venereal Disease, p. 351.

† Ueber die natur, kendniss, und heilart der scrophel krankhert, p. 105.

the disease remains in a latent state, and is manifested only by the symptoms which characterize the scrofulous diathesis, a reasonable prospect of success may be entertained from proper remedial management. Even so long as the disease shows itself only in the usual form of glandular swellings about the neck, without any indications of tubercular formations in the lungs, a judicious treatment will sometimes arrest the further progress of the disease, and occasionally gradually effect a removal of the scrofulous symptoms. When these tumors become irregular, uneven, immovable, painful, and inflamed, the difficulty of arresting their progress, and still more of effecting their entire reduction, may be regarded as nearly insuperable; and the prognosis will be the more unfavorable in proportion as these tumors are numerous. Suppurated scrofulous tumors, when they are situated externally, and not attended with strong constitutional tendency to the disease, are not, in general, to be regarded either as more dangerous or difficult of management, than mere inflamed tumors, although they are always extremely tedious in their progress, and cicatrize very slowly. Indeed, the *suppuration* of external glandular swellings is sometimes attended with a manifest melioration of the general scrofulous symptoms;* and when suppurations of this kind occur in individuals laboring under slight incipient symptoms of pulmonary tubercles, they should be encouraged, rather than suppressed or cicatrized, unless, indeed, they begin to assume very unfavorable or dangerous appearances.—When febrile symptoms, cough, and emaciation supervene, all hopes of successful treatment may be abandoned. 4. *The seat of the local scrofulous affections* forms, also, an important consideration in estimating the probable issue of cases of this disease. So long as the disease appears to be concentrated upon the external glandular structures, some prospect of an effectual removal of the malady may, with reason, be entertained; but when the ravages of the disease occur in deep-seated structures, or internal organs, particularly in the lungs and mesenteric glands, all ideas of ultimate recovery may be abandoned as entirely hopeless.

Treatment.—The first, and decidedly the most important part of the management of scrofulous affections, is a constant and careful avoidance of the various exciting causes enumerated above. Without an especial attention to proper observances in relation to this point, nothing, or at best but very little, can be effected by remedial treatment. The enjoyment of a pure, dry, and equable air; an attention to proper clothing, so as to obviate, as much as possible, the injurious influence of atmospheric vicissitudes; a wholesome, abstemious, but nourishing diet; regular exercise in the open air; and cleanliness, constitute the means upon which our hopes of successful opposition to the progress of the malady must chiefly be placed. So long as the disease shows itself only by a general scrofulous habit, without any important local affections, the diet should be simple, nourishing and digestible; and it is of great importance that the meals be taken at regular intervals, and no more food taken into the stomach at once than can be easily and completely digested. All kinds of stimulating irritating articles of food must be carefully avoided; and the same observation applies to every species of stimulating drink. The lean parts of tender and digestible meats may be moderately taken at noon; and for children, light animal broths, liquid, mucilaginous, or farinaceous preparations, barley, rice, boiled apples, turnips and milk, constitute proper articles of nourishment. With regard to the clothing of individuals laboring under a strongly developed scrofulous habit, it should be so regulated as to preserve as equable a temperature of the body as possible. Flannel should be worn next the skin, except in very warm weather, when it may be substituted by cotton. The influence of a pure and dry air, and if possible of an equable climate, is all-important to the successful management of this malady. It would appear, from the observations of some writers, that the air along the sea-coast is often peculiarly beneficial in scrofulous affec-

* Bordeu, Recueil des pièces qui on tremporté le prix de l'Acad. Royale de Chirurg., vol. iii. p. 69, as quoted by Richter.

tions; but these are advantages which can seldom be enjoyed but by the wealthy, and the majority of scrofulous subjects in large towns cannot even obtain the benefits of a pure country air, so desirable in the treatment of this affection.—Inactivity and indolence are to be shunned as decidedly favorable to the progress of the malady. Walking, gestation in an open carriage, or, when the patient is old enough, riding on horseback, should be regularly practiced when the weather is favorable. The patient should rise early from bed, and retire seasonably in the evening, and particularly avoid the damp and chilling night air.

With regard to the medicinal treatment, whether for latent or active scrofula, the prominent indications are—to restore or maintain the integrity of the digestive, perspiratory, hepatic, and intestinal functions, and to support the general energies of the system. Of these indications, the regular maintenance of the action of the bowels and of the liver may be regarded as of primary importance. For this purpose recourse must be had to calomel or blue mass, in conjunction or alternation with proper aperients. Some diversity of opinion is expressed by writers as to the best mode of administering mercurials in this affection; and some even condemn them almost entirely as remedial means in scrofula, but most assuredly without just grounds. Undoubtedly, much caution is required in the employment of mercury in this disease, or where the scrofulous diathesis exists; for it cannot be questioned, that much mischief is apt to result from the constitutional or salivant influence of this article. Nevertheless, when it is given in small doses at proper intervals, followed by a mild laxative, or even in occasional purgative doses, its effects are often unequivocally beneficial, in every variety of scrofulous disease. When the bowels are in a loaded condition, and torpid, the treatment should be commenced by pretty active doses of some purgative, and this should be repeated every third or fourth day, until there is reason to believe that the fecal accumulations have been removed. For this purpose from two to six grains of calomel, according to the age of the patient, should be given late in the evening, and followed, next morning, by a dose of rhubarb, castor oil, or Epsom salts. When the intestinal canal has been adequately evacuated in this way, it will, in general, be better to depend on the exhibition of from two to three grains of blue pill every night, with a pretty smart purgative every fourth or fifth day. From such a course of management, in conjunction with proper dietetic regulations, I have in several instances obtained the most decided benefit. Mr. Lloyd gives five grains of blue pill every night, with half a pint of the compound decoction of sarsaparilla twice a day; and if the bowels are not moved during the forenoon, he administers some laxative, so as to procure moderate evacuations. This plan he pursues until the action of the bowels becomes regular, and then goes on exhibiting the compound calomel pill, in five grain doses, every second night, for an indefinite time.* The pills I have already frequently mentioned in the course of this work, appear to me peculiarly well adapted as an alterative in scrofulous affections. I have repeatedly prescribed them in cases of this kind with excellent effect.† The employment of mercurial aperients should be persisted in as long as the alvine evacuations continue to exhibit an unnatural appearance. Mr. Farr recommends mercurial *frictions*, as preferable, in his estimation, to the internal administration of this medicine, more especially in children. He directs five grains of the *unguentum hydrargyri fortius* to be rubbed in upon the arm or leg of children from four to eight years old; eight grains in children from eight to twelve years of age, and twelve grains for subjects of from twelve to fifteen years old. "The frictions are to be continued until no portion of the ointment can be observed to stain a clean finger when applied to the part."‡ Mr.

* A Treatise on the Nature and Treatment of Scrofula, &c.

† ℞.—Massæ pil. hydrarg. ℥ss.
G. aloes Socot. grs. x.
Tart. antimon. gr. i.—M. Divide into twelve pills. S. Take one every night, or second night, according to the state of the bowels.

‡ A Treatise on the Nature of Scrofula, &c., pp. 47–48.

Lloyd makes the following judicious observations in relation to the remedial treatment of scrofula in *children*. "Every one must have observed that the same medicine may act very differently on children even of the same age; and that what purges one violently, will have no effect on another. We should, too, be very careful not to exhibit violent purges; and we should particularly avoid large purgative doses of calomel, as, I am convinced, they often produce more general irritation than the evacuation they occasion from the bowels is able to relieve; and that they often so much weaken the stomach that it is a very long time before it is able to recover its natural powers." To keep up a regular action of the bowels, "any of the mild purgatives may be employed; and if one does not appear to have the proper effect, we should desist from its use and substitute another." Although purgative doses of calomel are apt to prove injurious, "we may derive the greatest assistance from exhibiting *alterative* doses of this article." The dose should be varied from a half to one grain, according to the age of the child, and repeated twice or thrice a week.

After the action of the liver and bowels has been in some degree brought to a regular state, benefit will in general result from the employment of the tonic vegetable bitters; and where the digestive functions are much impaired, it will be proper to resort to the moderate use of tonics, in conjunction with the alterative and aperient treatment, as soon as the fecal accumulations have been evacuated by a few brisk purges, in the beginning of the treatment. *Tonics* are, indeed, generally recommended as peculiarly advantageous in counteracting the scrofulous diathesis; but I am inclined to think, that, except where the digestive powers are very feeble, and the mucous membrane of the stomach free from irritation, the active employment of remedies of this kind is seldom attended with advantage. Most assuredly, they are decidedly indicated where the general system is languid and debilitated; but in children, high mucous irritation of the alimentary canal is so frequently present in scrofulous affections, and the general habit is often so irritable and prone to inflammatory excitement, that the indiscriminate use of tonics must be frequently productive of mischief. When the alvine and hepatic functions are restored by alteratives, aperients, and proper dietetic regulations, "the symptoms of debility and relaxation almost always soon disappear, under the use of a nourishing and digestible diet, regular exercise, warm clothing, and the enjoyment of pure air." Most writers speak favorably of *sea-bathing* as a means of invigorating the system and counteracting the scrofulous disposition. When the disease manifests itself in the form of a general scrofulous habit, without the presence of local affections, in a state of active progress, benefit may, no doubt, be obtained from this measure; but it does not appear to possess any peculiar powers, as many formerly supposed, in promoting either the discussion of scrofulous tumors, or the healing of the ulcers which proceed from them. (Lloyd.) It is also decidedly objectionable, where the scrofulous habit tends strongly to the formation of tubercles in the lungs, or where tubercular matter has already been deposited in the pulmonary tissue; and the same observation applies to the employment of the usual internal tonics. The tonics most generally prescribed are cinchona, gentian, steel, the mineral acids, and the *quinine*. Of these articles, the quinine appears to be particularly useful in certain states of scrofulous affections. Mr. Rennie, in a very excellent paper on the treatment of this disease, states that he found this preparation more effectual in allaying irritability, and that febrile diathesis which depends on atony of the stomach, than any other tonic he has ever used.* In the preceding part of this work, (p. 321,) I have already referred to Dr. Mackenzie's observations on the valuable powers of the sulphate of quinine in scrofulous ophthalmia; and in one instance of well-marked scrofula in an infant, which lately came under my notice, one grain of quinine given three times daily, after proper evacuants, afforded unequivocal advantage.

* London Medical Repository, 1825.

Where, along with the symptoms of gastric debility, much acidity prevails in the primæ viæ, alkaline remedies should be given, either by themselves, or, what is usually more advantageous, in union with weak infusions of the tonic vegetable bitters. The *alkalies* have indeed long been regarded as peculiarly beneficial in the management of scrofulous affections. Mr. Farr strongly recommends Brandish's *liquor potassæ* as a remedy for indurated, inflamed, and suppurated scrofulous tumors about the neck, as well as "in the thickening of the ligaments and periosteum, with caries of the bones." He asserts that he has found this medicine "pre-eminently successful both in arresting the further progress, and effectually eradicating a disease so destructive to human life." He employs it in connection with the mercurial frictions mentioned above. A drachm of this preparation is to be given twice a day to a child from four to six years old; to a patient of from six to eight years old, one drachm and a half; and to one over eight years old, two drachms are to be given in any agreeable drink. Its operation is slow, and must be long-continued.*

What has been said applies particularly to the constitutional treatment of scrofula. When the disease appears in an active form, the same general management may still be proper, to a greater or less extent, with additional remedies adapted to the local affections, and varied according to circumstances.

M. Dupuytren adopts a treatment in scrofula, differing materially from the methods of treatment generally followed. During the early period of the disease, he endeavors to fortify the constitution by the usual means resorted to in affections of this kind. When the complaint has advanced to what he calls its second stage—which is characterized by febrile irritation, local pains, swelling and inflammations, he rigidly avoids all remedies of an exciting character, and treats the disease as an inflammatory affection, by bleeding, leeching, low diet, &c.; and he asserts that by this mode of management he has often arrested the progress of the disease, and prevented caries of the bones, gibbosities, spontaneous luxations, suppurations, and destruction of the organs. The authority of M. Dupuytren is not to be lightly rejected; and yet I apprehend that, although decidedly proper in certain phlogistic cases, the antiphlogistic method he recommends cannot be so generally applied with benefit, as his observations would appear to indicate.†

Glandular swellings.—So long as the glandular tumors remain in an *indolent state*, all active local applications should be avoided; for as discussive means they are wholly useless, where these enlargements depend on a scrofulous diathesis; and by their tendency to irritate and inflame, may greatly hasten the progress of the disease. Nevertheless, with the view of preventing the surrounding parts becoming irritated by the pressure of the enlarged gland, it may be proper to bathe the tumors "with salt water, or some other cooling lotion." (Lloyd.) When the tumors become inflamed and painful, however, local antiphlogistic applications are in general decidedly indicated. Leeching, saturnine lotions, and cold applications should be resorted to where the skin over the painful tumor is as yet free from tension and inflammation; but "where several glands have coalesced, forming a large tumor, and the superincumbent skin is tense and discolored, the best applications are warm emollient poultices." The leeches should not be applied to the inflamed or discolored skin of the tumors, but to the sound skin immediately surrounding the swellings. "It often happens, that when the swellings have arrived at this height, an abscess forms; but it also happens, that they become indolent, and the pain and tension both subside. The tumor, however, remaining undiminished, will, upon examination, be found to contain in its upper surface a small quantity of fluid. In this case the application of a blister, to be kept open for a few days, and repeated according to

* The formula for preparing Brandish's *liquor potassæ* is given in the Edinburgh Dispensatory, edited by Dr. Dyckman, p. 459.

† Ratier on the Practice, &c., of the Parisian Hospitals.

circumstances, will often promote rapid dispersion of the fluid, and indeed sometimes of the whole tumor." In general, however, the application of blisters and other stimuli to glandular swellings, in an indiscriminate way, is calculated to do much mischief. The foregoing observations on the local management of scrofulous tumors are drawn from Mr. Lloyd's excellent treatise on this subject, a work to which the reader is referred for much valuable information in relation to the management of this alarming malady.

*Scrofulous ulcers.**—The successful management of scrofulous ulcerations is always attended with great difficulty. A great variety of local remedies have been recommended for the cure of ulcers of this kind; but without a judicious constitutional treatment, they are rarely capable of procuring more than temporary benefit, and when applied without great discrimination, may readily do much mischief. Mr. Rennie, who has paid particular attention to the effects of topical applications in scrofulous ulcerations, states that he has found the following compositions highly beneficial in foul and indolent sores of this kind.† When the thickened purple edges of the ulcers overlap the surface, and prevent cicatrization, they should be destroyed with some escharotic, and for this purpose the *kali parum*, or the nitrate of silver, should be employed. Mr. Lloyd recommends the former, in preference to any other applications of this kind. Slightly astringent ointments or lotions generally agree better with scrofulous sores than such as are more stimulating. A weak solution of the sulphate of copper, in the proportion of four grains to an ounce of water, or of lunar caustic, or the nitrate of mercury, will usually answer all the purposes that may be expected from such applications. Mr. Lloyd considers the diluted citron ointment as the best local remedy for promoting the healthy granulation and cicatrization of scrofulous sores.

Whatever topical remedies may be employed, and whether the local affection consists merely in enlargement of the lymphatic glands, or in ulcerations, it must not be forgotten that our main reliance should be placed on an appropriate constitutional treatment. Besides the general remedial measures already mentioned, and which may be deemed indispensable in all instances of scrofula, there are a vast variety of remedies which have been strongly recommended for the cure of this affection; and there can be no doubt, that some of them, at least, may, under certain circumstances or modifications of the malady, occasionally prove serviceable.

The *iodine* has of late years been a good deal used in scrofulous affections; and in certain forms of the disease, it is, without doubt, deserving of much attention. In mere local lymphatic tumors, its powers are unquestionable; but it does not appear to possess any decided remedial powers over glandular enlargements and ulcerations, depending on a scrofulous habit of body. In scrofulous inflammation of the eyes, it is said by some writers to be very useful—a statement which I have not, however, found verified in my own practice, although I have used it a long time, and in efficient doses, in five cases of this kind. For

* The only signs by which the scrofulous ulcer may be distinguished from one of a different character, are: "its occurring after a suppurated scrofulous tumor—the peculiar dull red, or purple color of its edges—its remaining indolent for a great length of time, neither increasing nor diminishing in size, and its being attended with that particular state of health which invariably prevails in the scrofulous constitution."—*Lloyd.*

† ℞.—Picis nigræ ℔i.
——— liquidæ ℔iss.
——— resinæ ℔ii.—M. ft. emplast.—Or,
℞.—Picis liquid. ℔ss.
——— niger. ℔i.
——— resinæ ℔i.—M. ft. emplast.—Or,
℞.—Picis liquid. ℔iii.
——— resinæ ℔iv.—M. ft. emplast. To be heated and spread at the time of application, not, however, too thinly. The best thickness seems to be from one to two lines.—*Loc. citat.*, p. 194.

the removal of insulated strumous tumors about the neck, it is decidedly the most effectual remedy we possess. The only three instances of this kind in which I have employed it, disappeared under the use of frictions with the ointment of the *hydriodate of potash*.* It should be observed, however, that a preternatural sensibility or irritability of the system; a tendency to irregular determinations, and the presence of internal local congestions; prominent gastric and intestinal derangement; febrile symptoms, general plethora, diarrhœa, a disposition to hemorrhages, and an inflamed or sensible state of the tumors, are decided contra-indications to the employment of this article, whether used externally or internally.

Mercury.—This article, as has already been stated, is of unquestionable utility, under cautious management, in scrofulous affections, by its tendency to correct the hepatic and alvine functions, and thereby contributing essentially to the restoration of the general health and vigor of the constitution. It has been supposed, however, to possess direct and specific powers over the scrofulous action, by its constitutional influence; but for this opinion there does not appear to exist any good foundation. It is, nevertheless, true, that in old and obstinate ulcerations of a scrofulous character, minute doses of corrosive sublimate, in union with some alterative ptisan, such as the compound decoction of sarsaparilla, will sometimes prove surprisingly beneficial. I have succeeded in curing several remarkably severe and obstinate cases of this kind, unequivocally of a scrofulous nature, by the continued employment of a tenth of a grain of this mercurial, thrice daily, in conjunction with the free use of sarsaparilla decoction; and there are, perhaps, few practitioners who have not witnessed its occasional good effects in similar instances of the disease. Except so far as it tends to correct the actions of the liver and bowels, this article does not appear to possess any direct power of dispersing scrofulous tumors; but, on the contrary, when its influence is carried to the extent of producing a manifest general mercurial action in the system, it not unfrequently accelerates the progress of these enlargements, and deteriorates the general habit of the body.

Narcotics.—Most of the officinal narcotic extracts were formerly much extolled as remedies in every variety of scrofulous affections. The confidence of the profession in their powers has, however, long since, in a great measure, passed away; and although some relief may occasionally be obtained from the employment of these articles, their effects on the disease rarely amount to more than a mere palliation of its symptoms, or a temporary suspension of its progress. The most celebrated of these articles are—conium, belladonna, hyoscyamus, and solanum dulcamara; but there are a great variety of other vegetable remedies of a similar character, that have been particularly praised for their occasional good effects in scrofula. Thus, *tussilago farfara* is much extolled by Hoffman: and Meza strongly recommends *digitalis* in small doses.† The expressed juice of *fumaria; chæreofolium; beccabunga; sonchus; lactuca; marubrium album* and *taraxacum*, have all had their advocates as remedies in this disease. Of all these articles, however, *conium* is decidedly the best; and which, in combination with small doses of muriate of mercury, I have known to do much good in scrofulous ulcerations.

The *muriate of barytes* was much in vogue as a remedy for scrofula some thirty years ago. It was introduced to the particular notice of the profession by Dr. Crawford;‡ and Hufeland, soon afterwards, published a small treatise, with cases illustrative of its remedial powers in this disease.§ Many other writers

* ℞ —Hydriod. potassæ ℈ii.
Axungiæ ℥iss.
Liq. potassæ caust. gtt. v.—M. ft. ungt. Of this ointment, a portion about the size of a small nutmeg should be rubbed in upon the tumor twice daily.

† De digital. purpur ejusque usu in scrofulus medico. Jenæ, 179.

‡ Duncan's Medical Comment., vol. iv. Dec. ii. p. 433.

§ Volständ. Darstell. d. krafte u. anwendung d. salzsaur. schwererde, &c.

have published statements favorable to the employment of this article; but general experience did not confirm these accounts; and it has long sunk almost into total, though, as I have some reason to think, not entirely merited, neglect. I have employed it in several cases of scrofulous ophthalmia, with unequivocal advantage; and I am persuaded that in some instances, at least, its powers might be very beneficially called into aid in the management of this intractable malady. It is slow in its effects, and must be used for a considerable time before any obvious amendment occurs in the disease. For the mode of employing it, the reader is referred to page 321 of this work.

Of a similar character is the *muriate of lime*—an article which, at one time, had considerable reputation as a remedy in scrofulous complaints. Thirty drops of a solution of one drachm of this salt to two ounces of water, are to be taken every three hours, and the dose gradually increased until it begins to affect the stomach. Fourcroy, Beddoes and Hufeland speak very favorably of its powers. Twenty years ago, I saw it employed in a case attended with several very large scrofulous tumors on the neck, and an ulcer in the left axilla, and although it did not accomplish a complete removal of the external affections, its beneficial influence was very manifest. In the early period of my practice, I employed this article in a considerale number of instances of scrofulous ophthalmia, and eruptions about the head in young children, and, as it appeared to me, with some advantage in several cases. General experience, however, has not established its usefulness, and it is now entirely neglected as a remedy in this affection.

Antimony, by its tendency to counteract inflammatory action, and to keep up the regular cutaneous exhalation, is a highly useful medicine under proper management, in certain varieties and stages of scrofulous affections. Under the head of Phthisis Pulmonalis, I have already spoken of its usefulness in counteracting the progress of tubercles in the lungs. This article is particularly useful when the glandular swellings manifest a tendency to pass into a state of inflammation; and in minute doses, it will co-operate very advantageously with warm clothing, to prevent the general scrofulous diathesis from passing into the active forms of the disease. That it possesses any direct or specific influence over the scrofulous action, cannot, indeed, be admitted; but by its general operation in promoting the secretions, and opposing an inflammatory tendency in the system, it is calculated to do much good in affections of this kind. Weikard and Richter recommend the following combination in scrofulous cutaneous eruptions.*

Some of the German writers speak very favorably of the effects of large and frequent doses of *assafœtida*, in scrofulous caries of the bones. Schmucker, in particular, has published a very favorable account of its powers in affections of this kind. Where the general circulation and habit are languid, benefit may be obtained from this remedy; but its beneficial influence, in cases of this kind, appears to depend solely on the general excitement and invigoration it imparts to the system. Richter recommends the following formula.† Of the importance of *tonics*, in conjunction with aperients, and the cautious employment of mercurials, for counteracting the scrofulous diathesis, I have already spoken, and I need here only repeat, that although unquestionably of primary consequence where the system is languid, and the digestive powers feeble, they are not only useless, but often prejudicial, where the general habit is phlogistic, and the alimentary canal

* ℞.—Antimon. crude. alcoholis ʒvi.
G. guaiaci ʒss.
Extract. aconit. ʒi.
Sacchar. albi ʒx.
Mucilag. g. Arab. q s.—M. To be made into boluses of xv grains each. One of these is to be taken four times daily by an adult.

† ℞.—Antimon. sulphuret. nigr. ʒii.
G. assafœtid. ʒiii.
Extract. cicutæ ʒss.
——— aconit gr. xv.—M. Divide into four grain pills. S. Take from four to five pills twice or thrice daily.

in a high state of irritation. During the active progress of glandular swellings, that is, whilst they are in a state of inflammation and suppuration, tonics can rarely be given without mischief. After the active state of the inflammation has terminated in foul and languid ulcerations, they may, in general, be used with propriety and advantage. In old scrofulous ulcerations, attended with general debility and relaxation, the employment of large doses of cinchona, quinine, or steel, is sometimes an indispensable auxiliary to the local applications and general alterative remedies that may be deemed proper. The following combination forms an excellent tonic in old scrofulous ulcerations, or in general where tonics are indicated in this affection, at any period of its course.*

The *aromatic tonics*, says Richter, deserve much attention in scrofulous affections attended with general relaxation and debility, and where the ulcers are foul and indolent. Of course, where there is a disposition to inflammation, they are decidedly objectionable. Weikard particularly recommends *calamus;* Richter speaks favorably of *cloves;* and Hufeland mentions a decoction of *rad. helenii; cort. winteranus; cort. et lig. sassafras;* and where the general habit is very torpid, Tilenius advises the use of the *essential oil* of sassafras, as being often peculiarly beneficial.

Sect. II.—*Bronchocele—Goitre.*

This very remarkable disease consists of a chronic enlargement of the *thyroid gland*. It commences with a small tumor on one or both sides of the larynx and trachea, which gradually increases in size, until, in the course of years, it acquires, in many instances, an enormous bulk, occupying the whole anterior part of the throat, from ear to ear, and projecting considerably beyond the chin, and occasionally even extending down to near the middle of the chest.†

In the early period of the disease the tumor is always soft, elastic, and spongy to the touch; the color of the skin natural and movable over the enlarged gland. In the progress of its enlargement, however, the tumor becomes more and more firm, until, at last, in severe cases, it acquires great density and firmness in certain parts, whilst small portions retain their original soft and spongy state. Although indolent, or free from pain or tenderness, during the early period of its progress, and in many cases of moderate size always so, yet in the majority of instances, where the tumor becomes large and indurated, transient pains are at times felt darting through the enlarged gland, at the same time that the skin assumes a slightly red or copper color, and the veins of the neck become large and turgid. No inconvenience whatever is experienced from the disease while the tumor remains soft and of a moderate volume; but when it acquires a large size, it generally gives rise to more or less difficulty of respiration, and a slight change or loss of clearness of the voice. In some cases the enlargement extends inwardly, so as to cause considerable pressure on the œsophagus and large blood-vessels in the neck, occasioning difficulty of swallowing, and, at times, great anxiety and palpitations of the heart, throbbing of the carotids, and dangerous and even fatal congestions in the brain. The progress of the enlargement is sometimes very irregular. The tumor in some instances remains stationary for a considerable time, then rapidly increases in size for a short period, and again

* R.—Ferri limatur. vel pulver. ʒiii.
P. rhæi ℈ii.
G. ammoniæ ʒii.
Tart antimon. grs. iii.—M. Divide into three grain pills. S. Take four pills three times daily.—Or,
R.—Ferri limatur. ʒii.
G. assafœtid. ʒi.
G. aloes soc. grs. x.—M. Divide into sixty pills. S. Take two four times daily.

† Albert, Foderé, Larrey, Keate, and Sir Robert Wilson, have all related instances of this kind.

continues nearly in the same state, or decreases until it again rapidly augments in volume. More generally, however, the progress of the tumor is very gradual and regular.

In many localities, where bronchocele prevails endemically, particularly in the deep valleys of the Alps, the disease is very frequently attended with a stunted and deformed development of the body, and a corresponding deterioration of the intellectual faculties. It is thus, that amidst these magnificent and beautiful scenes of nature, man alone is doomed to dwindle—to sink, under the inevitable influences that surround him, from his noblest prerogatives to the lowest state of corporeal and intellectual deterioration. The unfortunate beings who are affected in this manner—and, in some situations, the majority of the native inhabitants are more or less affected—are stunted in growth, with enormous heads, tumid necks, and a manifest degree of mental hebetude which, in aggravated instances, amounts to absolute idiotism. This combination of affliction is called *cretinism*, and the unfortunates themselves, *cretins*. Bronchocele has, however, no necessary connection with the general debasement of the moral and physical constitution of man; for, in many parts where the goitre is exceedingly prevalent, the development of mind and body is not impeded by the disease, or the endemic cause upon which it depends. Nevertheless, from the almost inseparable connection of these affections, where cretinism prevails, we can scarcely doubt of their dependence on some peculiar modification of a common cause.

The internal structure or substance of a goitrous tumor varies according to its age, or stage of progress. Recent enlargements of this kind consist generally of a gelatinous mass, or a cellular structure containing a glutinous fluid. Sometimes they exhibit a soft and spongy texture, with large cavities or cysts dispersed throughout their structure, containing a serous fluid. Old tumors sometimes contain masses of ossified or cartilaginous substances, imbedded in a soft, friable, or adipose-like matter,* and in some cases the goitrous tumor is filled with dark blood. Morgagni found tumors of this kind composed almost entirely of a number of cysts filled with a viscid transparent fluid; and occasionally the whole gland resembles a *mellicerous* or *steatomatous* tumor. Sometimes the goitrous enlargement consists almost wholly of a congeries of varicose veins.†

Bronchocele very rarely enters into suppuration; and the occurrence of active inflammation and ulceration is equally uncommon, and hardly ever takes place spontaneously, or without some external injury or irritating applications. Nevertheless, instances of spontaneous suppuration have occurred; and this has, in some cases, eventuated in a complete cure of the affection. Petit has mentioned examples of this kind. Alibert has recorded a case, where an enormous strumous enlargement of the thyroid entered into suppuration, and disappeared after the discharge of about five pounds of purulent matter, (*loc. cit.*, p. 467.) Suppuration does not, however, always, or even generally, terminate thus favorably. Sometimes the abscess ulcerates into the trachea, and causes suffocation. Instances of this kind are related by Morgagni, Valsalva, Lieutaud, Baillie, and Portal.

Diagnosis.—Although generally sufficiently distinctive in its external character, goitre, when not very large, and situated only in one of the lobes of the gland, may, on superficial examination, be mistaken for aneurism of the carotid artery, and still more readily for sarcoma of the trachea or neighboring glands; and, perhaps, for dilatation of the internal jugular vein. When the tumor accompanies the motions of the larynx and trachea in the act of swallowing, and is movable, wholly insensible, soft and spongy to the touch, and free from pulsation, we may conclude that it is of a strumous or goitrous character. When, however, the tumor is situated on one side of the neck, directly over the carotid, a pulsatory motion will be communicated to it by this artery, and in this case,

* Morgagni, Benetis, Baillie, Richter.

† Foderé, Essai sur le goitre et le cretinage, § 8.

much difficulty may occur in the diagnosis. An instance is mentioned in the *Diction. des Sciences Méd.*, where a tumor in the neck was pronounced to be aneurismal, by several eminent surgeons, which was afterwards found by Boyer to consist entirely of an enlarged lymphatic gland in the neck. An interesting example of this kind occurred in this city. A tumor on the neck was regarded as aneurism of the carotid by Drs. Griffitts, Chapman and Dorsey, which, upon dissection by Dr. Parrish, was subsequently ascertained to be composed wholly of an enlargement of a portion of the thyroid gland.*

From scrofulous enlargements of the glands of the neck, goitre may, in general, be distinguished by the position of the tumor—and the firmness and greater proneness to inflammation and suppuration of the former than the latter form of glandular disease. Mere dilatation of the internal jugular vein is also liable to be mistaken for bronchocele; but the former may, in general, be distinguished from the latter, by its situation, which is usually just above the sternum; and by its softness and compressibility, its undulating or pulsatory motion, and the general turgescence of the vein, and the sudden return of the tumor when pressure is removed.

Etiology.—One of the most singular circumstances in the history of this affection, is its permanent and extensive prevalence in certain localities, often of limited extent, whilst the inhabitants of the vicinal districts are almost wholly exempt from the malady. In no part of the world is the disease so prevalent, and so distressing in its character, as in some of the valleys of the Alps and Apennines. In certain districts of Switzerland and Savoy, almost the whole of the indigenous population are more or less affected with goitrous enlargements. In the valley of the Rhone, at Martigny, St. Maurice, Aigle, Villeneuve, Bourg, Lucerne, and at Dresden, and in the valleys of Piedmont, this disease is extremely common. Goitre occurs also extensively in various parts of Asia—particularly in Chinese Tartary and in Hindostan; and in certain districts in Africa, it is said to be very common. In England the disease occurs very frequently in certain mountainous districts of the counties of Derbyshire, Buckinghamshire, Surrey, and Norfolk. In our own country, also, there are localities in which goitre is of frequent occurrence. At Bennington, Chittenden, Camden, Sandgate, Windsor, and Chester, in Vermont, bronchocele is very common. In the State of New York it is frequenly met with at Oneida, the German Flats, in the Onondaga valley, in the township of Manlius, at Brothertown, in the neighborhood of Angelica in Allegheny county, and in various other localities in the northwestern districts of the state. In Pennsylvania it occurs not unfrequently at Pittsburgh, at Cannonsburgh, Brownsville, and along the Allegheny, Sandusky, and Monongahela rivers. It is met with in Virginia at Morgantown, and on the banks of the Cheat river.

Where the disease prevails endemically, it occurs at all periods of life from infancy to old age. Saussure, indeed, asserts that those who remain wholly free from the disease until they have passed the tenth year, very rarely, if ever, afterwards, become affected with it; and Kortum states, that it never occurs in infants, and in adults of the male sex. These assertions are, however, wholly unfounded, and have been abundantly contradicted by later observations.

Hacquet, for instance, states that he has met with goitre in infants; and he has known the disease to come on after the fiftieth year of age.† It is even asserted that infants have been born with goitrous tumors. Foderé,‡ Consbruch§ and Sterndale‖ have related instances of this kind. Iphofen, however, contends that

* See an essay on Goitre, by Dr. W. Gibson, in the first number of the Philadelphia Journal of Med. and Phys. Sciences.

† Neü Physic. Politische Reise, durch die Dacischen und Sarmatischen oder nord. Karpathen., p. 129, as quoted by Richter.

‡ Traité du Goitre et du Cretinisme, p. 18.

§ Klin. Taschenbuch., t. ii. p. 281.

‖ Lond. Med. Repository, vol. x. p. 200.

true congenital bronchocele never does take place, and that the cases which have been recorded as such, were, in all probability, lymphatic tumors of a different character,* or simply an unusually developed state of the thyroid gland. In general when the disease occurs in females after marriage, it is during the state of pregnancy that the tumor first makes its appearance. (Foderé.) It would appear that cold weather has a tendency to retard the increase, or even to diminish goitrous tumors; for it is by no means uncommon to find the enlarged gland perceptibly smaller during the winter than in the warm months of summer. Goitre occurs also in the inferior orders of animals—particularly in sheep, horses, and horned cattle.†

In relation to the *remote causes* of goitre, a great variety of opinions have been advanced; but our knowledge upon this interesting subject amounts, as yet, to little more than to some very general facts and a few plausible conjectures. It has been supposed that the habitual use of water impregnated with limestone or other calcareous substances, is the principal cause of this affection, (Coxe, de Luc;) and this appears to be the general opinion in Switzerland and Savoy. This, however, is satisfactorily contradicted by the fact that goitre prevails in districts where not the smallest portion of calcareous matter occurs in the water used by the inhabitants; and in many localities, where the water is highly charged with limestone, this affection is wholly unknown. (Barton, Iphofen.) Another opinion still entertained by many is, that the use of *snow water*, abounding in mountainous districts, is the cause of this malady, (Darwin, Selle, Percival, Desgenettes;) but there are many facts which conclusively contradict this view of the causation of the disease. Thus, in the valley of Chamouni, "where the water is nothing else than the droppings of snow water from Mount Blanc," bronchocele is but very rarely seen; while on the other side of the Col de Balme, in the valley of the Rhone, we hardly see anything else than goitre and cretinism. Again, in Lapland, where snow water is constantly used, goitre is a very uncommon affection; and on the contrary, the disease is known to prevail extensively in some parts of Africa, and in other warm climates, where snow and ice scarcely ever occur—as in the island of Sumatra.‡ The following observations made by Dr. Richardson, who accompanied Captain Franklin in his voyage to the polar sea, is decisive on this point. "Bronchocele is a common disease at Edmonston. The disorder attacks those only *who drink the water of the river*. It is, indeed, in its worst form, confined almost entirely to the half-breed women and children who reside constantly at the Fort, and make use of river water, drawn in winter, through a hole in the ice. The men, from being often from home on journeys through the plain, where *their drink is melted snow*, are less affected; and if any of them exhibit, during winter, some incipient symptoms of the disease, the annual summer voyage to the sea coast generally effects a cure. The natives who confine themselves to snow water in winter, and drink of the small rivulets which flow through the plain in summer, are exempt from the attacks of this disease." Iphofen (*loc. cit.*, p. 50) maintains that bronchocele is produced by the use of water entirely devoid of carbonic acid gas, but this, like the other opinions mentioned, is not sufficiently supported by facts to entitle it to any particular attention.

Many writers have attributed this disease to the use of *particular articles of food*. Thus, Dr. Drug, who saw a great deal of goitre in Derbyshire, conceives that goitrous affections are very generally produced in that district, by the use of *sour oatcake*, and other innutritious aliment, more especially inferior potatoes, &c. Magneti and Roncalli also have ascribed the disease to the abundant use of heavy and indigestible articles of food, particularly to fat and oily substances and chest-

* Der Cretinismus Philosoph und Med. Untersucht., Dressten. 1817, p. 4.

† Barton's Memoir on Goitre. Dr. Alexander Coventry—in the New York Medical and Physical Journal.

‡ Marden's Geschichte und Beschreibung von Sumatra, 64.

nuts, which, in some parts of Switzerland, constitute a large proportion of the ordinary nourishment of the peasantry. Its dependence, however, on causes of this kind, is decidedly contradicted by a variety of facts bearing directly on this point. Thus of different contiguous localities, we find the disease extremely prevalent in some, whilst in others it occurs but seldom, although the general diet and mode of living are the same. Besides the foregoing causes, various others have been mentioned as the probable source of this affection; such as the inordinate use of vinous liquors; the repulsion of cutaneous diseases; mechanical injuries of the thyroid gland by carrying heavy burdens on the head, &c.

The opinion that the disease depends on certain *atmospheric causes*, has received many advocates; and there are various circumstances, indeed, which favor this view of its origin. It is supposed by some, that a dense, stagnant, and humid atmosphere is the ordinary source of the disease; and this idea is countenanced by the circumstance that goitre is known to prevail extensively in many situations where the atmosphere is constantly loaded with moisture, as in the deep and shady valleys of the Alpine countries. (*Foderé*, *Saussure*, *Chavassein*, *D'Aubert*.) Foderé asserts that the frequency of the disease is found in many localities to bear a pretty close relation to the hygrometrical states of the atmosphere. In many deep, damp, and woody valleys, goitre is extremely prevalent; but in proportion as we ascend towards the more elevated and dry situations on the sides and tops of the adjacent mountains, the disease becomes less and less frequent. It is well known, moreover, that when young persons affected with goitre, remove from the valley in which the disease was contracted, to high and dry situations, the tumor almost always becomes considerably diminished in size, and in many instances disappears altogether.* It is even asserted, that in some foundling hospitals, where the air was suffered to become damp and malarious, goitre has been known to occur endemically—and that it disappeared again, after the air was rendered purer and dryer.† These facts certainly appear very strongly to countenance the opinion that the disease depends on atmospheric causes; but they may be used with equal propriety as arguments in favor of the dependence of the disease on some peculiar impregnations of the water used in the localities where it prevails. It must be observed, too, that bronchocele is known to prevail extensively in some elevated situations, where the air circulates freely, and is not charged either with humidity or paludal exhalations. Thus, at Annaberg, or Marienberg, and in several other localities pointed out by Iphofen, (*loc. cit.*, p. 42,) the air appears to be pure and dry, and yet goitre is a very common affection. Again, it is unquestionable that there are a vast number of deep valleys in every country, in which the air is stagnant, and particularly loaded with moisture and terrestrial exhalations, but in which goitre is nevertheless entirely unknown.

Humboldt advanced the opinion, that a deficiency of electricity in the atmosphere is intimately concerned in the production of endemic bronchocele;‡ and the same doctrine is strenuously advocated by Iphofen. It would appear from the experiments and facts adduced by the latter writer, that in all the situations where goitre prevails endemically, there is a constant deficiency of the electric fluid in the atmosphere; and he asserts, that when goitrous tumors are lessened or removed by a change of residence, from the low and humid situations in which they were produced, to elevated and dry districts, it is chiefly by the abundance of electricity which the atmosphere contains in the latter situations, that the salutary effect on the disease is produced.

Notwithstanding the plausible facts that may be adduced in evidence of the aërial character of the remote causes of goitre, it appears to me much more probable that it is not in the atmosphere, but in the *water* of goitrous districts,

* Edinburgh Med. and Surg. Journal, vol. v. p. 53.
† Richter, Chirurg. Biblioth., bd. viii. p. 500.
‡ Ueber d. gereizte Muskel. und Nervenfassern, b. ii. p. 208.—*Richter.*

that we must look for the cause of this malady. It cannot, indeed, be maintained that it is either snow water, or calcareous matter contained in the common water, that gives rise to the disease; but there are many facts which appear to me very clearly to show that the origin of the disease is connected with some peculiar condition of the water habitually used in those districts of country where the disease prevails. The account given of a goitrous family near Fort Schuyler, in the State of New York, by Dr. Coventry, demonstrates very conclusively the correctness of this view of the etiology of goitre. This family resided on the banks of a small stream, running through a bed of schist and slaty gravel. It consisted of seven members, all of whom, with but one exception, were affected with bronchocele. They were in the habit of using the water of the brook for all culinary and other purposes. In the spring of 1798, Dr. Coventry settled within three quarters of a mile of this family. "There being no well, and prepossessed with the idea of the hereditary nature of the disease," says Dr. C., "my family also used the brook-water; when towards the approach of winter, to my no small mortification and vexation, I perceived an evident thickening in the necks of my daughters. Then I first began to suspect the water of Regel's creek. The next summer I sunk a well, and since we commenced the use of it, none of my family has been subject to goitre." The goitrous family removed to Onondaga, and became entirely freed from the disease.*

Dr. Johnson, in relation to the etiology of goitre, observes that "the upper Rhone, where it falls into the lake of Geneva, is turbid, even to whiteness, with the *attritus* which its tributary Alpine streams carry along; but its waters, while nearly quiescent in the lake, become clear, and pass through the city of Geneva like translucent streams of bluish crystal. Among those who inhabit the banks, and drink the waters of the upper or turbid Rhone, there are twenty cretins and goitres for one that can be seen on the banks of the lower or filtered Rhone."† Dr. Coventry seems to think it probable that the substance with which the waters that give rise to this disease is impregnated, consists in aluminous particles. In dry seasons the surface of the schist, after having been acted on by the air, "becomes covered with a white efflorescence, which, on examination, is found to be alum." The material which furnishes the alum manufactured near Glasgow, in Scotland, is found "in the schist rock which forms the sides, bottom, and roof, of an exhausted coal-pit." This observation receives support, by the fact, that in certain districts in Europe, where alum is extensively manufactured, although elevated and dry, bronchocele is extremely common. (Iphofen.)

Whatever may be the remote cause of goitre, Dr. Gibson thinks, that "the disease arises immediately from an obstruction of the *tracheo-thyroideal* passages of Borden—of the openings communicating with the sacculus laryngeus and the thyroid, and of other passages with which we are unacquainted." "I am inclined," he says, "to draw this conclusion from the circumstance of a watery fluid being found to occupy naturally the cells of the thyroid gland—from this fluid being increased in quantity in almost every goitrous tumor—and from the passages of Borden being much smaller in the first dissection I made of bronchocele than they are usually met with in subjects without such disease. This is a mere conjecture; neither is it original—but was advanced by one of the older writers on surgery." (*Loc. cit.*, p. 65.)

* Dr. Coventry adds the following highly interesting facts. "A few years after this, I leased a small house, standing near the brook, to a Mr. Walworth, who had a son about twelve years old. This lad, in the course of a few months, exhibited appearances of bronchocele; he was sent from home, and his neck returned to its natural size; but in the succeeding season began to enlarge, and the family moved away." "About the autumn of 1802, I put a small flock of sheep into a pasture, through which the stream ran; next spring one lamb proved goitrous; the succeeding season every lamb had a swelled neck, and seven out of eight died. My next neighbor had sheep in an adjoining pasture, which was watered by a spring; his sheep had no distemper."—*New York Med. and Phys. Journ.*, June 1824.

† Med.-Chir. Rev., April 1825, p. 443.

Treatment.—Since the discovery of the extraordinary remedial powers of *iodine* in bronchocele, it is scarcely necessary to pay any attention to the various other means that were formerly resorted to for the cure of this affection; for it can hardly be presumed, that where the judicious employment of iodine fails, there can be any particular advantage obtained from any other remedies at present known. Although but a few years have elapsed since this remedy has become generally known to the profession, a very great number of instances of its successful employment in this affection have been reported. Dr. Manson has given a tabular statement of 116 cases of bronchocele treated by this article; and of this number, seventy-seven were completely cured, eleven much relieved, and but two not relieved; the remainder were discharged for non-attendance, or remained, improving under the treatment.* Dr. Manson used the iodine both internally, and externally in the form of a liniment,† rubbed into the tumor. In individuals of a very irritable or plethoric habit of body, or where the stomach and bowels are in a deranged condition, the free and protracted internal employment of iodine will sometimes give rise to various unpleasant symptoms, such as "headache, giddiness, sickness at the stomach, with some degree of nausea, languor and inaptitude for exertion." By suspending the use of the medicine for three or four days, these affections, in general, soon disappear. Where the inconveniences occasioned by the iodine are moderate, it will be sufficient to exhibit it in diminished doses. It is evident, however, from the experience of Dr. Manson and others, that the tendency of this article to produce unpleasant effects, has been much exaggerated by some writers. Dr. M. states that no inconvenience resulted from the internal use of this article, in any of the cases in which he employed it; but on the contrary, it generally appeared to produce a cordial and tonic effect, unless it was given in too large a dose. "Patients generally found themselves in better health and spirits after a course of treatment with the iodine, than they had previously been for years; and this observation applies not only to those who labored under bronchocele, but also to those who labored under other diseases in which iodine was exhibited." I have used this medicine in perhaps twenty cases of different diseases, both internally and externally in full doses, continued in some instances for six or eight weeks, without having ever observed any unpleasant consequences to result from its operation. It cannot be doubted, however, that in certain habits of body, it may give rise to unpleasant and even injurious effects; but this may be said, with equal justice, of every important article of the materia medica. Dr. Kolley, in a very interesting memoir on the medicinal powers of iodine, observes, as the result of his experience, that iodine is incomparably the most powerful remedy in goitre which has yet been discovered; but in order to employ it successfully, it is necessary: 1, that the disease be confined to the thyroid gland; 2, that the tumor be devoid of a scirrhous or sarcomatous character; 3, that the disease be not inveterate, or of very long standing; 4, that the general health be not particularly deranged or impaired; and 5, that the goitrous tumor be free from inflammation. Where these conditions are not present, the iodine will almost invariably effect a cure. It would appear, that in general this remedy is most apt to give rise to unfavorable effects, where there is a tendency to congestions of the head and of other internal organs; and Dr. Kolly observes, that individuals of a robust, muscular, and what is usually termed atrabilious habit, do not, in general, bear the action of iodine without more or less inconvenience—particularly when unaccompanied by the use of laxatives. "In such constitutions, the tendency to local congestion increases; the head becomes confused, and cephalalgia often rises to such an extent as to threaten delirium." A deranged state of the di-

* Medical Researches on the Effects of Iodine in Bronchocele.

† ℞.—Liniment. sapon. ℥i.

Tinct. iodii ℥i.—Misce. This was rubbed into the tumor once, and in some cases twice daily.

gestive organs, all local inflammatory affections, diarrhœa, and phthisis pulmonalis, are unfavorable to the beneficial operation of this remedy.*

In general, the *external* application of the iodine in the form of an ointment, or liniment, will procure all the benefit that can be derived from this remedy in goitre. Mr. Coindet has entirely left off its internal employment, and recommends frictions on the tumor with the following ointment.† Internally, ten drops of a tincture made by dissolving forty-eight grains of the iodine in an ounce of alcohol may be given twice daily.

Of the various other remedies that have been particularly recommended for the cure of bronchocele, it will be sufficient merely to mention the following: *Burned sponge;* this article, no doubt, owes its remedial powers, in this affection, to the small portion of iodine it contains. It is given in doses of from a scruple to a drachm daily, and will occasionally remove goitrous tumors. *Calcined egg shells;* the external application of *sea water*, (Lieutaud;) *hepar sulphuris*, (Selle, Foderé;) *the vinegar of squills; kermes mineral; belladonna;* and especially, *conium maculatum; digitalis;* burned *boletus suaveolens*, in union with small portions of muriate of soda and lime; *the muriate of barytes;* and the different preparations of *mercury* and *antimony*. Externally, repeated *blistering;* frictions with stimulating liniments; mercurial ointment; various stimulating plasters; cataplasms, or bags of emollient herbs, applied over the tumor; and compression; have all been recommended, and occasionally used with advantage in this affection.

In some cases, however, the disease bids defiance to the powers of medicine, and the tumor goes on increasing until it becomes so large as to endanger suffocation, or some other fatal consequences. In instances of this obstinate and dangerous character, the passage of a seton through the tumor appears to promise more success than any other mode of treatment. Dr. Quadri has published an interesting memoir on the treatment of this affection by setons;‡ and Mr. Copeland Hutchinson has adopted this practice with complete success.§ "He passed a long and narrow seton needle, armed with half a skein of silk thread, obliquely through the substance of the gland from the left lobe upwards, leaving a space of nearly two inches from the entrance and escape of the instrument." Mr. Hutchinson refers, also, to a case successfully treated in this way by Mr. Thompson, and to another one by Mr. James, of Exeter and Devon Hospital. An instance of the successful use of the seton by Mr. Lyford, is related in the *Med.-Chir. Rev.* for July 1827.‖

Extirpation has also been resorted to, and, it is said, in a few instances with success. Foderé refers to some cases where tumors of this kind were removed

* Reflexions et Observations sur l'Emploie de l'Iode en Médecine. Par le Docteur Kolley.

† ℞.—Hydriod. potassæ ℈ii.
Axungiæ ℥iss.
Liq. potassæ caust. grs. iv.
Ft. ungt.

‡ Medico-Chirurg. Transact., vol x.

§ Medico-Chir. Rev., March 1822.

‖ [The seton sometimes produces excessive inflammation of the tumor, and has been followed by fatal results. It is chiefly in cases of *hydro-bronchocele*, or hydrocele of the neck, that setons and stimulating injections have proved serviceable. I have met with more decided success, however, from free incisions and the subsequent introduction of lunar caustic into the cavity of these cysts so as to excite discharges of pus and the growth of granulations. I have repeatedly extirpated large tumors, both encysted and sarcomatous, from the thyroid with success. In one case I removed the entire enlarged gland and saved the patient from suffocation thereby. When the gland is merely hypertrophied, we may reasonably expect to disperse the swelling by judicious treatment perseveringly employed. But surgical remedies will be required when any actual disorganization has taken place. The diagnosis is always sufficiently easy. The experienced practitioner will not confound the hard, irregular lobulated masses which are the result of degenerations of the thyroid gland, with the smooth and uniform rounded tumors, unaccompanied with any change in the color of the skin, and in which mere fleshy hypertrophia is perceptible.—Mc.]

by excision; and Dr. Harris has given an account of two instances of the successful extirpation of bronchocele. It must be observed, however, that this operation is always attended with much danger; and many cases might be collected from writers, in which the attempt to extirpate bronchocele was followed by fatal hemorrhage, or some other disastrous consequences.

There is another operation which has been performed with more or less advantage by several surgeons—the *tying up the thyroid arteries*. The operation was first performed by Mr. Blizard, of London. The tumor, in the instance he relates, diminished one-third in size, in the course of a week after the operation; but an attack of hospital gangrene, followed by repeated secondary hemorrhages, finally destroyed the patient's life. Dr. Jameson, of Baltimore, also took up the superior left thyroid artery in an inveterate case of goitre, with the effect of considerably diminishing the size of the tumor; and other instances of this operation, attended with still more decided success, have been recorded.

CHAPTER X.

CHRONIC DISORDERS OF THE ASSIMILATIVE FUNCTIONS.

SECT. I.—*Scorbutus—Scurvy.*

SCURVY does not appear to have been much observed until about the middle of the sixteenth century. Soon after that period, however, it became an object of particular attention, and in conformity with the prevailing notions concerning the agency of morbid humors in the production of diseases, almost all chronic affections—gout, rheumatism, hypochondriasis, and particularly cutaneous affections, were ascribed to a scorbutic disposition and acrimony of the blood. Masked scurvy was supposed to be present in almost every variety of acute and chronic disease; and there has perhaps never been an opinion in pathology which has been carried to so injurious an extent as the doctrine of a latent scorbutic humoral diathesis.*

At present, however, the term is properly restricted to a peculiar form of the disease, which is undoubtedly connected with a morbid condition of the blood, arising from a want of proper nourishment, or other causes tending to derange the assimilating functions. This affection seldom occurs in its more aggravated form, except among seamen; although slight, and occasionally even very severe, cases are met with in individuals, deprived of wholesome nourishment and a pure air, who have always resided on shore.

Symptoms.—The disease commences with an unusual degree of lassitude and want of muscular energy; a feeling of stiffness of the knees and feet is experienced, attended with depressed spirits, and a great disinclination to corporeal exertions. The muscular weakness gradually increases, and the respiration becomes short and panting on the slightest bodily exertions. The countenance exhibits a pale and sallow, or lead-colored and bloated appearance; the skin is dry, and sometimes peculiarly tense and shining, and separates in small scales on different parts of the body. Sooner or later, brown or livid spots make their appearance on the surface, generally first on the legs, then on the thighs, and last on the arms and abdomen, but they very rarely appear on the face. In connection with the appearance of these maculæ, œdematous swellings of the feet and legs occur; and, in hot climates, extensive anasarcous effusions sometimes

* Richter, Specielle Thérapie, bd. p. 795.

ensue, without any of the ordinary scorbutic blotches. Simultaneously with the occurrence of the spots on the skin, and in many instances at an earlier period, the breath becomes fetid, and the gums tender and spongy, and extremely apt to bleed on being even lightly touched. The patient complains of a putrid taste, and usually expresses a strong desire for fresh vegetable food and acids. The urine is turbid and dark-colored, the vision becomes more or less impaired, and the muscular powers so prostrated that the patient can scarcely maintain the erect position. The blood is thick, dissolved, and very dark; the pulse weak and soft. As the disease advances, stiffness of the joints and indurations in the muscles occur, accompanied with severe pains in the thighs, back, and loins, particularly in the knees; and the patient, at times, experiences violent spasmodic or flatulent pains in the bowels, attended with retraction of the umbilicus, and constipation. The respiration is constantly more or less oppressed; subcuticular extravasations of blood appear on the extremities, and occasionally on other parts of the body; and passive hemorrhages occur from the gums, nose, rectum, bladder, &c., at the same time that ulcers are formed on the calves of the legs and thighs, exhibiting an œdematous and flabby appearance, with irregular and bloody edges, and discharging a red ichorous fluid. The gums separate from the teeth and slough, and the teeth become loose in their sockets, and often drop out; old and cicatrized wounds re-open; the bones become brittle, and syncope occurs on slight corporeal exertions. If the disease continues unchecked in its progress, extreme prostration at last ensues; respiration becomes exceedingly anxious, fatiguing, and oppressed; syncope, even while the patient is at rest, or merely by turning himself in bed, occurs frequently; a cadaverous or fetid effluvium exhales from the body; emaciation goes on rapidly, and in some instances paralysis of one or more extremities ensues, or extensive dropsical effusions, jaundice, diarrhœa, or dysenteric discharges, and finally a rapidly exhausting irritative fever, or coma and convulsions, close the scene.

The *duration* of scurvy is, *in general*, protracted; but there nevertheless occurs a very considerable diversity in this respect. In violent instances of the disease, where its progress is favored by previous habits of living, or, perhaps, by a peculiar constitutional predisposition, the disease sometimes acquires great severity in the course of a few weeks. This, however, is rarely the case with *land scurvy*—the most rapid and fatal instances usually occurring on board of ships while at sea. Land scurvy very rarely appears in the violent form described above. In many instances it continues for a long while, with no other symptoms than languor, a fetid breath, spongy and hemorrhagic gums, and brownish spots on the legs, with slight œdema of the feet, and a pale and puffy countenance—the patient being all the while able to be up and about. Sometimes it shows itself chiefly by blotches of extravasated blood on the inferior extremities, and foul and bleeding ulcers on different parts of the body, with spongy and tender gums.

Post-mortem phenomena.—The different cavities of the body generally contain an abundance of serous fluid, mixed, in many instances, with more or less blood. The mucous membrane and surface of the viscera commonly exhibit dark and apparently gangrenous spots; and blood is found extravasated in different parts of the cellular tissue, under the membranes, and sometimes into the alimentary canal, the lungs, and even into the abdomen. The heart is flaccid and pale; the spleen soft, and turgid with dissolved blood; the muscles livid, and often so soft that they may be easily broken down between the fingers. The bones are usually very brittle, or preternaturally soft—particularly the epiphyses, which may sometimes be separated from the bones with great ease. The blood is universally found in a dissolved state, and very black.

Causes.—Persons of a debilitated and phlegmatic habit of body, with a disposition to obesity, are said to be most subject to this disease. The *exciting causes* are: the habitual use of innutritious, unwholesome, or an exclusive *salt animal* or *vegetable* diet, more especially when conjoined with much fatiguing labor, and exposure to a *damp* and *impure* atmosphere. Anxiety of mind, with a sedentary

mode of life, and the habitual intemperate use of spirituous liquors, contribute also very considerably to the production of scurvy. Damp and impure air, however, in conjunction with a vitiated or exclusive salt animal diet, is by far the most common source of this malady, whether it originate on land or on sea.

In relation to the essential nature or proximate cause of scurvy, pathologists have expressed a variety of opinions. That the blood exhibits a morbid condition, is unquestionable; but whether this state of the humors is primary or secondary, in reference to the occurrence of the disease, has been a subject of much controversy. Lind, Milman, Sprengel, and Dreysig contend that scurvy consists essentially in a weakened and relaxed state of the *solids*, of which the changes which occur in the blood are mere consequences. On the other hand, Hoffman, Trotter, Jackson, Cullen, and some later writers, consider a putrescent or morbid state of the blood as the primary and essential condition upon which the debility and relaxation of the solids and the other characteristic phenomena of scorbutic affections, more or less directly depend. From a view of the nature of the most common and powerful remote causes of this disease—namely, unwholesome, innutritious, and especially an exclusive salt animal diet, the idea of its dependence on a deranged or vitiated state of the blood appears very plausible; and the more so, as we know that the chyle, and, we may presume, the blood, also, are manifestly modified, according to the nature of the aliment used. The circumstance, too, that a scurvy which occurs while the individual is confined to a particular kind of diet, almost invariably soon begins to disappear when the aliment is changed, argues directly and strongly in favor of its humoral origin. It is nevertheless most probable, that the fundamental affection consists in a deranged condition of the chylopoietic functions and of the process of sanguification; for it can scarcely be admitted, that any considerable change could occur in the composition of the blood, without a previous derangement of the functions that are more immediately concerned in the elaboration of this fluid. That the morbid condition of the blood, resulting from a disordered action of the functions just named, has a direct, and perhaps a principal share in the production and support of the characteristic phenomena of the disease, cannot, I think, be doubted; for an intimate depravation of the general mass of the blood, from whatever cause it may arise, must, one may suppose, necessarily give rise to a universal morbid condition of the organization—more especially to the reproductive or *vegetative* functions of the system.

Prognosis.—In general, the prognosis in scurvy is not very unfavorable; and in the ordinary cases of the disease, manifestly the result of some peculiar and exclusive aliment, it very rarely resists an appropriate change of regimen. Indeed, it is surprising how rapidly even very aggravated instances contracted at sea, will often disappear as soon as the patient is put on shore, or is allowed a fresh vegetable and acescent diet. In severe cases, however, the influence of the *land air* is occasionally, though indeed very rarely, manifestly injurious, and greatly hastens the progress of the malady. (Richter.) After the disease has continued until symptoms of extreme prostration and universal depravation of the solids and fluids are induced, such as great difficulty of respiration, frequent syncope, and sloughing of the gums, with extensive œdema, or dropsical effusions, there is but little advantage to be expected from any mode of management. When the disease occurs in persons of a gouty habit of body, or is complicated with syphilis, the prognosis is always to be regarded as unfavorable; and a broken-down constitution, by the frequent use of mercury, is also particularly calculated to enhance the obstinacy and dangerous consequences of the malady.

Treatment.—The first and most important part of the remedial management of scurvy is the removal of the causes which produced the disease. When it is the result of impure diet, and a vitiated and damp air, more wholesome food and a purer atmosphere are indispensable. The scurvy which occurs at sea, is almost universally the consequence of the exclusive and long-continued use of *salt* animal food, and of bad and impure water; and hence cases of this kind almost always

disappear very speedily, as soon as the patient is put upon the use of *fresh* vegetable and animal food, and vegetable acid drinks—such as *lemon juice* and good vinegar. The employment of acids of this kind, particularly the lemon juice, is one of the most effectual means for preventing or arresting the progress of this affection, when it arises from the use of old and salted meats. It appears, however, that vegetable acids are not so universally beneficial in this affection as has been supposed. An interesting account of the total failure of lemon-juice in arresting the progress of scurvy on board of the British ship Leander, is given in the *Med.-Chir. Rev.* for June 1824.* After this acid had been fully tried, without the least benefit, the disease was quickly vanquished by the free use of *fresh animal* food, in conjunction with vegetables. Dr. Bampfield, also, in his work on tropical dysentery, speaks of the great benefit which may sometimes be derived from *fresh* animal food, in sea scurvy. In general, however, a *mixed diet*, composed of fresh animal and vegetable articles of food, is the most salutary in scurvy arising from the exclusive use of old and salted meats, or of unwholesome, coarse, and oily aliment. There are certain vegetables, which experience has shown to be especially beneficial in this affection; and they should undoubtedly be used whenever they can be had. The principal of these are—horseradish, scurvy-grass, garden-cresses, water-cresses, garlic, onions, the fruit of cloud-berries, lettuce, celery, endive, spinage, carrots, cabbage, oranges, mustard, and all kinds of acid fruits. Of all these vegetable substances, however, cabbage in the form of *sour-krout* is decidedly the most valuable, both as a preventive and curative means. Fermented liquors, buttermilk, fresh milk, vinegar and water, but especially water acidulated with lime juice and a decoction of malt, taken freely as common drink, are highly proper beverages in scorbutic affections.

Medicinal articles are seldom of very material service in the treatment of scurvy; and without the proper changes in diet already mentioned, they are always wholly ineffectual, and may even prove injurious under the most careful management. Mr. Patterson, however, speaks very favorably of the effects of a solution of nitre in vinegar, in the proportion of four ounces of the former to a quart of the latter—given in doses of from half an ounce to two ounces twice or thrice daily. Mr. Charles Cameron, a naval surgeon to the British Naval Medical Board, has lately published a statement confirming Mr. Patterson's favorable account of the effects of nitre in this affection. This disease broke out among the convicts on board the *Ferguson* transport, on her passage from Ireland to New South Wales; and threatened, by its violence, to exterminate the crew. After employing the usual means with but little success, Mr. Cameron had recourse to nitre and vinegar; and the effects, he says, were highly and promptly beneficial. "The oppression and sinking at the pit of the stomach," which were so distressing to the majority of patients, yielded almost without exception to a few doses of this mixture. "Eight ounces of nitre were dissolved in so much vinegar as would make the solution amount to sixty-four ounces." One ounce of this solution was given at a dose from three to eight times daily.† During

* "In the year 1822, his majesty's ship Leander sailed from Trincomalee for the Cape of Good Hope, taking on board the mechanics of the dock-yard establishment then reduced on the island. There were also embarked twenty-six invalids, and all the sick that could be removed from the hospital. These invalids and sick were principally affected with chronic hepatitis, dysentery, and phthisis pulmonalis, all of which (even some who were expectorating large quantities of purulent matter), recovered on the passage to the Cape. This good fortune was counterbalanced by scurvy, which broke out among the crew, and, in spite of large quantities of lemon juice plentifully administered in conjunction with every other antiscorbutic which the ship could produce, spread to an alarming extent, and in one case proved fatal. Had they not reached the Cape at the time they did, the Leander would have presented as deplorable a spectacle as the Anson at Juan Fernandez, notwithstanding the supposed specific *lemon juice*, which in no instance on board the Leander had the slightest effect in even checking the ravages of scurvy. Immediately the ship reached the Cape, and the crew got plenty of fresh *animal* food, in conjunction with vegetables, they rapidly recovered. Specimens of the lemon juice were transmitted to the Victualing Board, and carefully analyzed in London. It was found perfectly good."

† Medico-Chir. Rev., Feb. 1830, p. 484.

the stage of convalescence, some advantage may be derived from tonics, particularly iron, cinchona, calamus aromaticus, cort. aurantior., cort. winteranus, cascarilla, and the *mineral acids*. Richter mentions the following infusion as often very useful in the treatment of land-scurvy.* An infusion of calamus and Peruvian bark, with the addition of elixir vitriol, is particularly praised by Jahn. Kotrum asserts that he has derived considerable advantage from the use of *savin* in this affection; and the bark of the *betula alba* is said to have been very beneficially employed in this affection. As a local application to scorbutic ulcers, whether situated in the mouth or elsewhere, a strong solution of the muriate of lime will in general answer a very good purpose. Water acidulated with muriatic acid, and sweetened with honey, forms an excellent lotion for the gums. A weak solution of the sulphate of copper, or of lunar caustic, may also be beneficially employed for this purpose.

Sect. II.—*Chlorosis*.†

This disease occurs principally in young, *unmarried females*, and occasionally also in married women, at various periods of life. It is not, however, exclusively confined to the female sex, for its occurrence in males, during the period of adolescence, and even at mature age, is sometimes, though indeed but rarely, noticed.

Symptoms.—In the commencement of chlorosis, the countenance exhibits a peculiarly pallid appearance, and the lips especially appear to be bloodless, with a puffiness of the upper and lower eyelids, and a slight appearance of tumidity of the face. The lower eyelids are often encircled with a streak of a dark or leaden hue, and in some instances the eyelids exhibit a greenish sallow tinge. As the disease slowly proceeds in its course, the whole surface of the body becomes very pale, more especially the hands, fingers, and nails, and presents a white, puffy and flabby state, with more or less œdema of the ankles and legs, and an evident tendency to emaciation. The tongue is pale, and covered with a transparent mucus, and exhibits a swollen or bloated appearance, with numerous and enlarged papulæ, and the edges indented by the pressure of the teeth. The gums and internal surface of the cheeks also become tumid, and paler than natural, and the breath is generally foul. From the commencement of the disease, much general languor and listlessness prevail, with great indisposition to corporeal or mental exertion. Headache, ringing or noise in the ears, and vertigo are common symptoms, and the energies of the mind are subdued, accompanied, in many instances, with a drowsy, peevish, and spiritless condition. In the more acute cases of chlorosis, considerable pain is apt to be experienced in the hypochondriac regions; and, in some instances, cough, oppressed respiration, paroxysms of palpitation of the heart, or partial syncope, "and almost universally a sense of fluttering about the præcordia," are experienced by the patient. The appetite is usually weak; but in many instances there is a distressing morbid craving for particular articles, particularly for acids and absorbent earths, as magnesia, chalk, or even clay. The bowels are generally torpid, with occasional transient attacks of diarrhœa and griping—the feces usually presenting a very unnatural appearance, with thick and sedimentous urine. The catamenial function always becomes early deranged, and in many cases the menses are suppressed before the occurence of the chlorotic symptoms.

* ℞.—Rasur. raphan. rustic. ℥iii.
Ferri. pulverat. ℥i.
P. rad. rhæi ℥ss.
Rad. zingiberis ℥ii.
Vin. alb. generos. ℔ii.—M. Stent in infus. per xii. horas, cola. Take a teacupful three times daily.

† See Dr. Marshall Hall's excellent little work "On the Disorders of the Digestive Organs," &c. &c.

When the disease continues until it becomes confirmed, the countenance acquires a still more pallid, bloodless, and puffy appearance; the prolabia assumes a pale lilac hue, and the skin becomes smooth, dry, puffy, and of a singularly pale yellowish color. By degrees the tongue acquires a clean and smooth surface, and exhibits a peculiar, semitransparent, exsanguious, and pale lilac appearance. The general languor and debility increase, and the occasional attacks of pain in the head and side become more severe. In this confirmed stage of the complaint, the morbid cravings of the stomach are often peculiarly strong and singular. The patient experiences an indomitable desire for certain indigestible substances, such as chalk, cinders, sand, coffee-grounds, tea-leaves, flour, clay, &c. The catamenia, if they have not previously ceased, are attended with pain, and become pale, smaller in quantity, and usually terminate in more or less profuse leucorrhœa, where this affection does not precede or accompany the chlorotic disease in its course from its commencement.

In inveterate cases of chlorosis, emaciation goes on slowly but progressively. The muscular debility is extreme; the œdema increases, and acquires the form of anasarca; the pulse is very small, frequent, and in many instances quick and corded; the confusion and pains in the head are more permanent; the mind extremely excitable, or unusually torpid and sluggish; and the attacks of dyspnœa and palpitation of the heart become more frequent and distressing. Sometimes diarrhœa ensues—the matter discharged exhibiting a dark, or even black appearance, resembling in all respects the evacuations of *melæna*.

In cases of a more chronic character, "there is a continued though variable state of sallowness, of yellowness, or icterode hue, of darkness, or of a wan, squalid, or sordid paleness of complexion, or a ring of darkness surrounding the eyes, and extending a little perhaps towards the temples and cheeks, and sometimes encircling the mouth, without tumidity as well as without the pallidness of the prolabia already mentioned." In the severer cases of *chronic* chlorosis, the nails are apt to become deformed in a peculiar manner, sinking down in the middle, and breaking off in brittle laminæ on the anterior margin. The tongue, in such instances, (chronic chlorosis,) exhibits various appearances. In general it is clean, moist, often of a *bright red*, and sometimes of a light green or pale lilac color, with a smooth, shining, or a granulated raw appearance of the surface, sometimes divided into lobules by deep creases, and at others bloated and indented along the margin by the pressure of the teeth. *The blood in chlorosis is usually attenuated, the relative proportion of the crassamentum, or red part, being invariably less than natural.* (Hall.)

Chlorosis is peculiarly liable to frequent changes and exacerbations of its symptoms. Dr. Hall observes that he has often observed "an eruption of urticaria, in very large, elevated wheals, sometimes solitary, and at others in considerable numbers, in chlorotic patients."

Diagnosis.—Chlorosis is liable to be confounded with certain forms of *insidious organic disease.* From disorders of this kind, however, we may in general distinguish chlorotic affections, without much difficulty, by the following circumstances. The pallid countenance of organic diseases is usually attended, at times, with a slight flush of the cheeks; and the prolabia are free from that peculiar bloodless and semitransparent pallidness or lilac hue, which is so characteristic of chlorosis. The countenance, too, is generally expressive of pain and suffering in organic diseases, which is seldom met with in chlorosis, except in the latter periods of aggravated cases; and the whole surface of the body remains either nearly in a natural state, or becomes slightly *icterode*, whilst emaciation usually commences early and proceeds rapidly. From chronic disease of the liver, with which chlorosis is most apt to be confounded, we may distinguish it, by the *icteric* appearance of the conjunctiva, and of the surface generally, as well as the clay-colored feces, the bilious urine, and the usual tenderness and fullness of the right hypochondrium, which occur in organic hepatic affections.

Causes.—A sedentary and confined habit of life, more especially when assisted

by impure and stagnant air, is a common and powerful cause of chlorosis. "The mimosis decolor," (*chlorosis*,) says Dr. Hall, "is the prevailing affection of those females who, in manufacturing towns, are doomed to sit from morning till evening at the lace-frame, or the tambour, or engaged in mending, seaming, chevening," &c. Unwholesome and indigestible diet, particularly when accompanied with indolence, want of cleanliness, and want of exercise in the open air, is especially calculated to produce this disease. Too long lactation; frequent hemorrhages; protracted or long-continued menorrhagia; leucorrhœa; the depressing mental affections; long-continued and exhausting labor; and unsatisfied sexual desires; are not unfrequently the source of chlorotic affections. There are few circumstances, probably, more frequently concerned in the production of this disease, than chronic intestinal irritation; and consequent derangement of the digestive functions. A torpid and loaded state of the bowels, in young females, when co-operating with one or more of the above-named causes, rarely fails to give rise to more or less of a chlorotic condition. Chlorosis sometimes occurs apparently in consequence of the tardy, or non-appearance of the menses, after the sexual organization is fully developed, and the same occasionally results from suppressed menstruation in females of a delicate and leucophlegmatic habit of body. Occasionally, however, the disease comes on gradually, while the menses are regular, without any obvious exciting cause: but in instances of this kind, the bowels will generally be found, on inquiry, to be torpid, and the appetite variable and disordered.

Treatment.—Little or no benefit can be derived from remedial treatment, so long as the exciting causes continue to act on the patient. These, therefore, must be obviated as early and effectually as possible. If the disease be contracted under the influence of a sedentary habit, and an impure or confined air, regular exercise in the open air will be indispensable to the removal of the malady. If deficient and unwholesome nutriment has contributed to the production of the disease, the use of a more pure and nourishing diet is necessary. Where grief and despondency have exercised an injurious influence in this respect, efforts must be made to dissipate the mental depression, by proper society, travel, and conversation.

In the majority of cases, conspicuous symptoms of a loaded or otherwise disordered state of the alimentary canal are present; and to these symptoms of intestinal derangement it is particularly important to pay immediate and especial attention. Dr. Hamilton has laid great stress on the value of purgatives in the cure of chlorosis, and although his estimate of their usefulness is undoubtedly too favorable, it must be admitted, that under judicious management, they are generally decidedly beneficial, and in many cases perhaps absolutely indispensable to successful treatment. Where the abdomen is tumid and tense, and the bowels torpid, laxatives must be employed until the accumulated feculent matter has been thoroughly evacuated. It is to be particularly observed, however, that active cathartics, or such as excite copious *liquid* stools, are calculated to do much mischief. Two or three consistent or soft alvine evacuations in the course of twenty-four hours, will be sufficient to procure all the advantages that can be derived from aperients, without the risk of doing injury by increasing the debility, or exciting permanent intestinal irritation. Moderate doses of aloetic aperients are, I think, decidedly the best remedies for this purpose. From three to four grains of rhubarb, in union with one or two grains of aloes, taken in the evening, will in general procure one or more full and consistent evacuations on the following morning; and this dose may be given every third or fourth evening, until there is reason to believe that the bowels have been freed of their vitiated and accumulated contents. As the liver almost invariably partakes of the morbid excitement of the alimentary canal, it will be proper from time to time to exhibit small doses of blue pill or calomel. Dr. Hall recommends the administration of five grains of the latter article once every week, or every ten or fourteen days, according to the degree of hepatic derangement indicated by the symp-

toms; whilst "on the intermediate days, a sufficient, consistent alvine evacuation must be procured, by pills of aloes and rhubarb, or by infusion of senna, with sulphate of magnesia." In the use of mercury, the utmost caution is necessary to prevent a general mercurial impression on the system, the object in employing it being solely to correct the hepatic and intestinal secretions. Where the disease continues until diarrhœa, with small, unnatural and fetid discharges occur, small doses of blue pill, in union with ipecacuanha and the extract of hyoscyamus, will in general afford much benefit. A grain of the blue mass, with two grains of ipecacuanha and one grain of the hyoscyamus, may be given every night on going to bed. I have known this combination to produce the happiest effects in an instance attended with such symptoms. Dr. Hall has obtained very good effects from the conjoined employment of opium and blue pill, in cases attended with diarrhœa. If opiates are indicated, Dover's powder will in general do more good than any other preparation of this narcotic.

In conjunction with the use of remedies calculated to correct the hepatic and intestinal functions, it is particularly important to regulate the *diet* of the patient. The aliment should be simple, nourishing, and of the most digestible kind. In the commencement, before the bowels have been adequately evacuated, the more nourishing kinds of farinaceous fluids and light broths should be used, such as preparations of barley, rice, arrowroot, oatmeal, &c.; but after the accumulated feces have been removed, and the hepatic and intestinal secretions in some degree corrected, solid animal food, particularly the lean parts of mutton, lamb, venison, and very tender beef-steak, and boiled fowl, with stale bread or biscuit, should form the principal articles of the aliment; in short, the patient should observe all the dietetic rules laid down for the management of the first stage of indigestion.

The enjoyment of a *pure country air*, and *regular exercise* by gestation, are powerful auxiliaries in the treatment of this affection; and along with an appropriate diet and gentle aperients, are generally adequate, without any other means, to restore the health of the patient. After the system has regained some degree of vigor, advantage may be obtained from *sea-bathing;* but this will seldom be admissible until convalescence has already considerably advanced. At an earlier period, however, "sponging the body with cold water, or with vinegar and water," or the *tepid* shower-bath in summer, will often do much good; but even these applications cannot be freely used with propriety, where the powers of vital resistance are greatly reduced.

Dr. Marshall Hall does not seem to entertain a favorable opinion of tonics administered internally, with the exception of iron, which, he thinks, may be used with some advantage. After due alvine evacuations, and an amendment of the intestinal and hepatic secretions have been effected, by the cautious use of aperients and mercury, I am disposed to ascribe very considerable importance to the internal employment of *tonics*. When early employed, and in large doses, previous to the preparations just mentioned, they are, no doubt, well calculated to do mischief, and at all events, can rarely prove in any degree beneficial. Iron is the best tonic we possess in chlorotic affections. No preparation of iron has appeared to me so useful in diseases of this kind as the *black sulphuret* of this metal. From eight to ten grains may be given three times daily. Its peculiar usefulness would seem to depend on the tendency which it generally manifests to excite a moderate diaphoresis, in conjunction with the ordinary tonic powers of the ferruginous remedies. The *tartrate of iron*, too, is a valuable tonic, on account of its tendency to keep up a regular action of the bowels—so contrary to all the other preparations of this metal. From a scruple to two of the tartrate may be given twice or thrice daily, dissolved in some sweetened water. The *phosphate* and *carbonate* are so apt to give rise to constipation, that they are, in general, objectionable on this account, unless diarrhœa be present, when they may be appropriately used. Richter observes, that after the exciting cause has been obviated, and the alimentary canal sufficiently evacuated, the following

combination "cannot be too highly recommended."* When the digestive powers are much debilitated, we may administer the iron in union with some of the tonic vegetable bitters, with peculiar advantage.† Among the Germans, Wieckart's pills‡ have been highly recommended in obstinate cases of chlorosis. Kopp declares that he has employed them with great success in this affection. The chalybeate mineral waters are especially beneficial in chlorotic cases. The use of the ferruginous remedies should be continued until the health of the patient is completely restored. The clothing should be sufficiently warm to favor the regular action of the skin; and the influence of damp and inclement weather must be carefully avoided. Dr. Bland says: "The real cause of chlorosis, under all its Protean forms, is a vicious and imperfect sanguification; the blood being defective in crassamentum and coloring matter, and in consequence becoming less capable of imparting functional energy to the body. In some cases severe gastrodynia attends, not to be relieved by ordinary remedies. Occasionally frequent attacks of asthma; sometimes excruciating headaches, murmuring noise in the head, and symptoms of diseased heart."

Dr. Bland considers iron as among the very best remedies. He thinks that it is not, generally, given in sufficient doses to derive the benefit which it is capable of affording. His favorite formula is thus:

℞.—Ferri sulphat.,
Potassæ subcarb., āā ʒss.—M. In pil. forty eight dividend.

The dose, at first, is one pill night and morning, to be increased gradually in a fortnight to four pills morning, noon and night.—(*Revue Médicale.*)

CHAPTER XI.

CHRONIC DISEASES OF THE SEXUAL ORGANS.

Sect. I.—*Gonorrhœa.*

A running or discharge of purulent matter from the urethra, has been noticed as a loathsome affection "by successive authors, from the earliest periods in which we have any medical records," but it was not considered as having any essential connection with syphilis, until upwards of half a century after the introduction of this latter disease into Europe. Since that period, the relation subsisting between these two affections has been a subject of much controversy; but the general opinion at present is, that they are radically distinct, each depending on its own specific virus, although some eminent physicians still contend for their identity. The experiments of John Hunter, which appeared to prove that

* ℞.—P. lig. quassiæ,
Sacch. alb., āā ℈i.
Flor. martialis grs. x.—M. Divide into twenty-four equal parts. S. Take one every four hours. This mixture, he says, possesses the advantage of not being liable to cause constipation.

† ℞.—Ferri phosphat. ʒi.
Pulv. cort. aurant. ʒiii.—M. Divide into ten equal parts. Give one three times daily.

‡ ℞.—G. aloes Soc. ʒi.
Ferri. pulver. ℈ii.
Sulph. antimon. aurant. ʒss.
Submur. hydr. ℈i.
Ol. sabin. xx.
Syrup. cort. aurant. q. s.
Ut fiant pil. grs. iii. Take two every evening.

gonorrhœal matter is capable of forming chancre, and, on the contrary, that matter taken from a chancre, when brought in contact with the urethra, will form gonorrhœa, have been contradicted by various experimenters—more especially by Mr. Benjamin Bell; and the very frequent occurrence of gonorrhœa, where of course the virus is largely and constantly applied to the glans penis, without the appearance of chancre, is strongly opposed to the opinion of their specific identity. It must, indeed, be admitted, that chancre and gonorrhœa frequently appear together, but where this is the case, there can exist but little doubt that the two poisons were communicated either at the same impure venereal intercourse, or at distinct connections. I have lately seen an instance illustrative of this fact. The patient labored under gonorrhœa of about six weeks' standing: before it was cured he had connection with a woman; and in six days afterwards a genuine excavated syphilitic chancre made its appearance.

Gonorrhœa generally comes on in three or four days after an impure connection; but in some instances it appears within the first forty-eight hours, and occasionally not until the expiration of eight or ten days after the application of the virus. At first, a disagreeable itching or pricking sensation is felt in the point of the urethra, passing a short distance up from the orifice, which on examination will be found slightly reddened and somewhat tender. After this sensation has continued for ten or twelve hours, the mouth of the urethra becomes sensibly inflamed and swollen, and a limpid or yellowish matter begins to ooze from it. The stinging and itching increase, and the emission of urine occasions a severe smarting and burning pain in the anterior portion of the urethra. The pain now extends more or less speedily inwards along the urethra; the glans penis becomes swollen, dark red, and tender to the touch, and the discharge acquires a yellow-greenish color, resembling diluted pus. Frequent and very painful erections harass the patient—more especially after he has been some time in bed; and on passing water, the pain, in some instances, is exceedingly smarting. In many cases the inflammation extends from the mucous membrane of the urethra to the corpus spongiosum, giving rise to much tenderness and hardness of this part, and particularly to a most painful affection called *chordee*, which consists in strong and protracted erections, whilst, from the inflamed and unyielding state of the corpus spongiosum, the penis is thrown into a curved form, with the frænum drawn down and the body forced upwards. At this stage small portions of blood are often mixed with the gonorrhœal discharge; and the prepuce sometimes become much inflamed, tumid, and slightly excoriated at the edges and in spots on its internal surface.

In some instances, one or more of the inguinal glands become inflamed and swollen, and a knotted cord of inflamed lymphatic vessels is felt along the dorsum of the penis. Many patients experience a constant aching pain in the glans and body of the penis; and occasionally one or both testicles become tender, inflamed and much swollen, attended with pain along the whole course of the spermatic cord. Considerable symptomatic fever always attends, when the inflammation becomes thus extended from the urethra to the neighboring structures. Not unfrequently the whole track of the urethra becomes inflamed, giving rise to harassing sensations of burning and titillation in the neck of the bladder and anus, and very severe cutting pains in the perineum on making water. The patient, under these circumstances, feels a continual urgency to make water, but from the great tenderness of the neck of the bladder and urethra, only a few scalding drops are voided at a time. When the testicles become inflamed, the gonorrhœal discharge is always sensibly diminished, and in many cases entirely suppressed. Sometimes some of the engorged capillaries of the mucous membrane burst, and more or less of pure blood passes off. After an uncertain period, these inflammatory symptoms begin to subside. The scalding pain in making water gradually ceases; the erections become less frequent and painful; and the gonorrhœal matter acquires a greater consistence and becomes white and ropy.

The specific inflammation of gonorrhœa is primarily seated in the mucous

membrane of the urethra, a short distance above its orifice in the *fossa navicularis*, and chiefly affects the *lacunæ mucosæ* of Morgagni, and their excretory ducts. From this point, however, it often extends higher up the urethra, to the membranous portion, the veru montanum, and neck of the bladder.

Sometimes the gonorrhœal matter, in the first instance, does not penetrate the urethra, during impure venereal connection; but being applied to the glans penis, it gives rise to irritation and a discharge of thin purulent matter from the sebaceous glands situated around the corona glandis. Much more commonly, however, the matter discharged from the urethra comes in contact with the internal surface of the prepuce and the glans, and causes excoriations of these parts, from which a thin whitish or whey-like fluid is discharged. These excoriations usually appear in the form of irregular patches, leaving interstices of sound skin between them. It would seem, too, that the virus of gonorrhœa, when brought to act on the glans and internal aspect of the prepuce, often produces a peculiar variety of venereal ulcer, of a mild character, exhibiting a smooth, level, and nearly circular surface, slightly raised above the surrounding skin, having a healthy color, but without granulations and induration, and exhibiting somewhat of a fungous appearance. (Carmichael.) These ulcerations are most commonly seated on the anterior and posterior verge of the prepuce, or beside the frænum, and generally connected with more or less phimosis. In some instances, gonorrhœal discharge from the urethra is accompanied both by excoriations and ulcers of the kind just mentioned; but more frequently the disease is attended with simple excoriations of the prepuce and glans. Gonorrhœa is sometimes succeeded by constitutional symptoms—and this is most apt to be the case in those instances of the disease that are attended with the primary excoriations or ulcers just mentioned. Mr. Travers asserts, that so long as the mucous surface remains sound, or unbroken by excoriation, gonorrhœa is not capable of producing secondary symptoms.* He contends that the absorption of the virus or matter is indispensable to the production of constitutional symptoms, and that "*the inflammatory secretions of sound surfaces are not absorbed into the system.*" Experience, it must be admitted, supports the assertion, that secondary constitutional symptoms very rarely occur, except in cases that are attended with primary gonorrhœal excoriations or lesions of the mucous surface from which the discharge occurs; but it admits of much doubt whether such lesions are indispensable to the production of secondary symptoms; and still more, whether the assertion that absorption cannot take place from an inflamed mucous surface, be strictly correct.

In some instances, the secondary symptoms of gonorrhœal sores are almost as strongly marked as those of lues; sometimes the glands of the groin become much enlarged and indurated. The inflammation in the fauces is usually diffuse and superficial, the surface of the velum palati and uvula being often "roughened with innumerable small tufts of white lymph, or pitted with small shallow indentations where ulceration has taken place." Sharp, deep and clean fissures of the tonsils sometimes succeed gonorrhœal ulcers on the genitals. The cutaneous affection is always mild, consisting of minute papular eruptions, varying from a pale red to a deep crimson color, which are ushered in by pyrexia and redness, pain and swelling of the joints. These papulæ do not come out together, but follow each other in succession. Some of them are simply pimples, while others are almost advanced to the pustular form. These are most numerous, and in some instances almost altogether confined to the parts about the shoulders, arms, and back. The febrile symptoms are transient, and the papular affection usually disappears without difficulty under the use of purgatives, a simple and unirritating diet, antimonials, and an equable and dry air.

In *women*, gonorrhœa is very rarely attended with the painful symptoms that accompany the disease in men. Indeed, in many instances there is so little uneasiness and pain experienced by females from this disease, that the discharge is

* Observations on the Pathology of Venereal Gonorrhœa.

often regarded as simple fluor albus. It is very remarkable, that gonorrhœal inflammation in females is exceedingly seldom, if ever, extended to the urethra. Swediaur asserts that he has "never seen a woman in whom the disease was seated in the urethra." The orifice of this canal, however, is generally more or less irritated, and in some instances it becomes so very sensible, that the urine in passing off gives rise to extremely severe pains. The seat of the disease is usually either in the clitoris, round the orifice of the urethra, and on the nymphæ in the cavity of the vagina, or at the inferior commissure of the labia and rapha. (Swediaur.)

Women affected with gonorrhœa, generally experience a disagreeable itching and titillation about the orifice of the vagina, and at the rapha. In severe cases, the labia, nymphæ and clitoris become swollen and extremely tender; and there is generally a severe burning and stinging pain felt in voiding the urine. In violent instances of the disease, there is a constant aching pain, experienced in the bladder, womb, groins and back; and the upper and inner surface of the thighs often becomes inflamed, excoriated, or covered with an inflamed pustular eruption, from the irritation occasioned by the gonorrhœal discharge.

In general, the mucous surface from which the gonorrhœal matter proceeds, is entirely free from ulceration or excoriation. But this does not appear to be always the case, as was formerly asserted by writers; for, according to the observations of Whately, irregular patches of excoriation, similar to those which appear on the prepuce and glans, sometimes occur on the lining membrance of the urethra. It must be observed, however, that excoriations or ulcers of the mucous membrane of the urethra in this affection, are by no means essential conditions of the disease.

It should not be forgotten, that a purulent discharge from the urethra in men, and vagina in women, resembling in all respects genuine venereal gonorrhœa, may occur without any impure connection or infection, by a specific gonorrhœal virus. A knowledge of this fact will sometimes enable the physician to allay the most painful suspicions, and to establish peace and confidence in families divided and distressed by the occurrence of such affections. Mr. Travers has made some very judicious observations on this subject.* An inflammatory action of the mucous membrane of the vagina, in whatever way it may be produced, will convert the vaginal mucus into a purulent or puriform fluid; and it seems to be well ascertained, that such a morbid vaginal secretion is capable at times, "of communicating the inflammatory irritation to other mucous surfaces either of the same or another individual." "It is well known," says Mr. Travers, "that a woman affected with inflammatory leucorrhœa sometimes communicates a discharge to her husband;" and the origin of purulent ophthalmia, in infants, from the same source, is equally well ascertained.

Treatment.—Gonorrhea appears to have a natural tendency, if left to itself, to terminate spontaneously. At first, as has already been stated, the matter is thin, and communicates a greenish stain to the linen; but as the inflammation gradually subsides, the discharge becomes thicker, cream-like, and less abundant; and if the general habit is not phlogistic or irritable, and the patient avoids the influence of stimulating causes, the secretion of the gonorrhœal fluid often gradually diminishes, until, in the course of six or eight weeks, it ceases entirely.

There are few individuals, however, who are willing to delay the use of the remedial measures, or who are sufficiently prudent to abstain from stimulating ingesta and other causes calculated to keep up the phlogistic habit of the system, to obtain such a favorable result; and in most instances, either from injudicious attempts to arrest the discharge, or from a general inflammatory and irritable diathesis, favored by stimulating diet and drink, the disease, if it is not subdued by an appropriate treatment, degenerates into a chronic urethral discharge, consisting of a milky fluid, usually called *gleet*.

* Loc. citat.

During the inflammatory stage of the complaint, it should be treated strictly as a local inflammatory affection, without any regard to the peculiar nature of the inflammation, or the attending muco-purulent discharge. In plethoric habits, particularly where the pulse is hard and active, blood should be freely drawn; and the inflammatory state of the system must be reduced by the use of internal antiphlogistic remedies. For this purpose, the saline purgatives, nitre, and tartarized antimony, are the most useful remedies we possess. Dr. Carmichael is particularly partial to the use of the *tartarized antimony*, dissolved in a solution of *sulphate of Magnesia;* and when given so as to keep up a slight degree of nausea, and procure four or five alvine evacuations during the day, this combination is, in fact, a highly efficient remedy during the inflammatory period of this complaint.* Nitre and antimony dissolved in a large proportion of some mucilaginous fluid, such as a solution of gum Arabic, barley-water, or flax-seed tea, is in general very serviceable, as a means for lessening both the scalding of the urine, and the general and local inflammatory action.† In conjunction with these remedies, the patient should drink freely of some bland, mucilaginous fluid. For the relief of the painful erections and chordee, which usually harass the patient, particularly at night in bed, cold applications may be tried; but although occasionally beneficial, they frequently procure but very little relief.—*Warm* fomentations, or emollient cataplasms, are more frequently serviceable, in this respect, than cold applications to the part. *Opium*, given in full doses, is in general a very useful remedy for this purpose; and its good effects are often considerably enhanced by giving it in union with camphor. From one to two grains of the former to eight or ten grains of camphor, taken an hour before going to bed, will generally prevent the occurrence of these painful affections during the night. Mr. B. Bell strongly recommends the use of *camphor* and *hyoscyamus*, as a means for alleviating the sufferings occasioned by chordee.—These articles, he says, should be given in large doses. In general, half a drachm of the former, with a scruple of the latter, given in the course of twenty-four hours, will be found sufficient to allay this affection; but in some instances, he gave it to twice this extent in the same period of time.‡ If bleeding takes place from the urethra, it ought not to be arrested, unless it becomes too copious, which very rarely happens. When it is desired to stop the hemorrhage, pressure made upon the urethra with the hand for twenty or twenty-five minutes, will almost always suffice to arrest it. Rest and a mild unirritating diet always contribute very materially to the reduction of the inflammatory symptoms. Much advantage may also be obtained from the application of warm fomentations to the penis, during the inflammatory stage of the complaint.

Nothing is more common than the employment of astringent injections, almost as soon as the disease commences; and although the discharge may sometimes be speedily arrested in this way, the consequences are often extremely injurious. "This practice," says Mr. Carmichael, "is attended with such risk of exciting inflammation of the entire urethra and bladder, and all the immediate, as well as the secondary train of evils attendant upon this calamity, that I have no hesitation in saying, that it is a practice that cannot be too strongly deprecated."

As soon as the general and local inflammatory symptoms are in some degree reduced, and the discharge has become thick and more purulent, balsam copaiva, cubebs, or what are called the terebinthinate remedies, must be resorted to. Almost all writers agree in giving a preference to the *balsam copaiva*, as a remedy in this affection; and when given in large doses, it will in fact, more frequently

* ℞.—Sulphat. magnesiæ ℥ii.
Tart. antimonii grs. ii.—M. Take a tablespoonful every two or three hours.

† ℞.—G. Arab. ℥iss.
Nitrat. potassæ ℥i.
Tart. antimonii gr. i.
Infus. sem. lini. ℥xvi. Of this a wineglassful may be taken every hour.

‡ Edinb. Journal of Medical Science, No. 1, January 1826.

put a stop to the disease than any other article we possess. To obtain the full advantages which it is capable of affording, it should be given in as large doses as the stomach will bear. The following is an excellent formula for administering this article.*

Balsam copaiva may be safely and beneficially administered in this affection where the general habit is not very irritable or phlogistic, even though the local inflammation may still remain in an active state. I have often given it in the beginning of the disease, as soon as the bowels were freely evacuated by a saline cathartic, with complete success.

Indeed, many eminent practitioners do not hesitate to administer it in large doses, soon after the commencement of the disease; and where the inflammation is not particularly violent, and the general arterial system does not sympathize with the local affection, it may be employed with advantage. Dr. Johnson observes, that according to his experience, this article "may be safely administered in drachm doses, during the inflammatory stage of the disease, and with palpable success. Under such a treatment, incipient gonorrhœa has ceased in two or three days."

Cubebs, also, are an excellent remedy in gonorrhœa. They are, however, much more stimulating than the preceding article, and must be given with more caution during the inflammatory stage of the disease. Mr. Jeffries states, that where cubebs are serviceable, they usually begin to manifest their beneficial influence within forty-eight hours after the first dose; and where no material relief is obtained in the course of five or six days, their further use will rarely be attended with advantage.† This remedy appears to be most apt to do good in relaxed and leucophlegmatic habits; and in order to derive the full advantage which it is capable of affording, it should be given in large doses. From six to eight drachms of the powdered cubebs may be given in the course of twenty-four hours, where the inflammatory action of the affected parts has been previously considerably reduced. The tincture is an excellent mode of administering the cubebs. I usually direct a large teaspoonful of it every four hours. Much more commonly, however, I have given it in combination with balsam copaiva, according to the following formula.‡

In cases entirely free from general irritation, and inclining to a chronic character, I have often united the balsam copaiva, cubebs, and spirits of turpentine, with peculiar advantage; and in *gleet*, I know of no remedy which so frequently succeeds in making a decidedly favorable impression on the disease as the tincture of cubebs in union with the spirits of turpentine, in the proportion of two parts of the former to one of the latter, given in teaspoonful doses, three or four times daily.§

* ℞.—Bals. copaiv. ℥i.
Spir. nit. dulc. ℥ss.
Tinct. opii,
Spirit. camphoræ, āā ℥i.—M. Of this a teaspoonful should be taken four times daily.

† Practical Observations on the Use of Cubebs in the Cure of Gonorrhœa, p. 18.

‡ ℞.—Bals. copaiv.
Tinct. cubebæ, āā ℥i.
Spir. nit. dulc. ℥ss.
Tinct. opii. ℥i.
Sacch. alb. ℥i.
P. g. Arab. ℥i.
Aq. fontanæ ℥viii.—M. Take a tablespoonful three or four times daily.

§ My friend Dr. Dodd, of the United States navy, has informed me that he has employed the *extract of cicuta* with great success in gonorrhœa. He avers that in the very considerable number of instances in which he prescribed this article, it generally removed the disease completely in three or four days, and not unfrequently sooner; but "under very unfavorable circumstances, the cure was not effected under eight or ten days." He employs it as follows: ℞.—Extract cicutæ ℥i; G. opii grs. x.—M. Divid. in pil. No. xv. Two of which are to be taken every two hours, and continued until vertigo and a disagreeable sense of fullness in the head are experi-

It is proper to observe, that the use of medicines of this kind ought always to be continued for four or five days after the discharge has been arrested by them; for when they are discontinued as soon as the running ceases, it very frequently returns in the course of five or six days; and when this happens, we rarely find the medicine to produce the same beneficial effect as it did in the first instances. Many of the obstinate cases I have met with were relapses of this kind, after the discharge had been suspended by the use of terebinthinate remedies.

When, notwithstanding the free employment of the medicines of this kind, the discharge continues, recourse should be had to astringent injections. Under judicious management, and after the inflammatory stage has passed off, local astringent applications may be used without the least risk of injury, and very generally with speedy success. A great variety of articles have been recommended for this purpose; but in general the *sulphate of zinc* will prove more promptly beneficial than any other astringent we possess. The injection should at first be weak—not above a grain and a half of this article to an ounce of water—but in proportion as the disease assumes a chronic character, the quantity of the zinc should be increased to eight and even ten grains to the ounce. It is a very common practice to unite the sulphate of zinc and acetate of lead in injections for this complaint; but it has never appeared to me that any peculiar advantages are to be derived from such a combination. It must, nevertheless, be observed, that there occurs much diversity in different cases, with regard to the utility of different astringent injections. We sometimes find a variety of injections wholly ineffectual in this complaint, when at last some particular combination or article will speedily put a stop to the discharge. This, no doubt, generally depends on the peculiar grade of the irritation of the mucous membrane of the urethra. In the atonic stage of the disease, I have often employed the diluted sulphuric acid with success, after the zinc and other articles of a similar character had failed to arrest the disease. A drop or a drop and a half of the *oil of vitriol* to an ounce of water, forms an injection of the proper strength. The sulphate of copper, too, may be advantageously used for this purpose. Two grains of this article to an ounce of water form an injection of the medium strength; but it will, in general, be better to commence with a grain to the ounce, and to increase it to three or four grains afterwards, according as the disease assumes a chronic character. In some instances the nitrate of silver, in the proportion of two grains to an ounce of water, will succeed very speedily; and in gleet or atonic gonorrhœa, the proportion of the silver may be increased to three or four grains to the ounce.* I have in a few instances of very obstinate gonorrhœa, succeeded with an injection prepared from the balsam copaiva in the following manner. Two drachms of the balsam are to be triturated in a mortar with a drachm of *carbonate* of magnesia. After they have been rubbed together, eight ounces of warm water must be added, and well mixed with the magnesia and

enced. His object is to put the system under the narcotic influence of the cicuta, and to sustain this influence until the discharge ceases, which seldom requires more than two or three days.

Dr. Edward Graffe, of Berlin, has employed the *chloride of lime* with much success in gonorrhœa. When there is much burning in the urethra and chordee, he directs a tablespoonful every two hours of a solution of one drachm of the nitrate of potass in eight ounces of almond emulsion. When by this remedy the burning and chordee are considerably allayed, he orders a tablespoonful of the following mixture every three hours: ℞.—Chloride of lime ʒi; Almond emulsion ℥viii; Mucilage g. Arab. ℥i. In general, after three or four doses of this mixture are taken, the patient experiences painful erections, burning in the course of the urethra, and pain in voiding urine. All these symptoms, however, usually abate in the course of two or three days; and by the time that they are entirely removed, the gonorrhœal discharge also ceases. The cure is thus generally effected in the course of five or six days.—*Journal für Chirurgie und Augenheilkunde*, bd. xiv. s. 9.—*Amer. Journ. Med. Sciences*, vol. viii. p. 240.

* [The alterative plan of treatment is now frequently adopted by surgeons. It consists in applying the solid caustic by means of the *porte caustique*; or in throwing up a strong solution by means of a glass syringe. This is a mere revival of Hunter's plan of cure by exciting a new action or counter-irritation. It is also accomplished by giving large quantities of cubebs in tablespoonful doses three or four times a-day.—Mc.]

balsam. It must then be suffered to stand until the water becomes clear, when it must be poured off and used as an injection. Mr. Foot, in a work on the venereal disease, published in London about ten years ago, strongly recommends the following solution as an injection in gonorrhœa, after the inflammation has subsided. Dissolve some sulphate of copper in a sufficient quantity of water; precipitate the solution with lixivium of tartar; suffer it to separate, then pour off the clear liquor. Wash the precipitate until the water becomes insipid; then make a saturated solution of carbonate of ammonia in water, and mix as much of the precipitate with the filtered solution of the ammonia as will dissolve, which reserve for use. Six drops of this ammoniated copper to an ounce of water, form an injection of the proper strength. Six or eight years ago, I used this injection in various instances, and generally with benefit.

In obstinate cases of *gleet*, the long-continued use of the tincture of cantharides, in conjunction with astringent injections, particularly a solution of the nitrate of silver, will sometimes succeed better than any other remedy. The cantharides should be given in gradually increasing doses, commencing with about thirty drops three times daily, until symptoms of strangury ensue, when it must be discontinued, and resumed after the *ardor urinæ* has disappeared. I have often succeeded with the internal use of the spirits of turpentine, in conjunction with injections; but this article is much more offensive to the stomach than the cantharides, and patients will seldom continue it a sufficient length of time to obtain the full advantages which it is capable of affording. The direct application of astringent and exciting applications by means of a bougie, will sometimes succeed, after all other remedies have failed. I have in several instances removed the disease by introducing a bougie, upon which some citrine ointment was smeared; and in one very obstinate and protracted case, I lately succeeded in effecting a cure, by applying in this manner the lunar caustic rubbed up with lard. Twenty grains of the caustic may be triturated with half an ounce of lard, as an application for this purpose. A gleety discharge is, however, very frequently dependent on the irritation of stricture of the urethra; and when this is the case, nothing but the removal of the stricture by the judicious employment of bougies will effect a cure. Whenever a thin milky discharge continues obstinately after the use of the foregoing means, we may suspect the existence of stricture; and on being consulted for aid in a long-standing case of this kind, it is always proper, before any remedial measures are adopted, to make the proper examination, in order to ascertain the state of the urethra in this respect.

It may be proper again to say, that where there is much irritability or active inflammation of the urethra present, all astringent or irritating injections are highly improper. When used under circumstances of this kind, they are apt to give rise to various distressing affections—particularly to obstinate chordee, inflammation of the body of the penis, of the neck of the bladder, and of the testes, and to strictures in the urethra. In relation to the formation of strictures, however, Mr. Carmichael makes the following observations, which are entirely accordant with my own views. "Strictures," he says, "are more generally attributed to the use of injections than any other attendant of gonorrhœa; but I have so often witnessed their occurrence where injections have never been used, that I am more inclined to ascribe these affections to the irritation of gonorrhœa than to any other cause. The sooner such irritation is removed, the more likely is the patient to avoid those unpleasant visitations which are far more to be dreaded than the original disease. I have, therefore, no hesitation in putting as speedy a stop to the discharge as I can, by the use of astringent injections, if the internal remedies mentioned disappoint my expectations."

The observations made above in relation to the propriety of continuing the internal terebinthinate remedies for several days after the disappearance of gonorrhœal discharge, are entirely applicable also to the employment of injections. In using injections care should be taken to prevent the passage of the fluid into the neck of the bladder, which may be readily done by making pressure over the

posterior part of the urethra, near the margin of the anus, at the time of using the syringe.

The *secondary symptoms* of gonorrhœa do not, in general, require any very active treatment.* An attention to cleanliness, with the use of the ordinary diaphoretic alterative ptisans, such as infusion of sarsaparilla, in conjunction with a mild mercurial course, the occasional use of the warm bath, and proper dietetic regulations, rarely fail to remove all these secondary affections. In relation to the employment of mercury, however, much discrepancy of opinion has been expressed by writers on this subject. My own experience is decidedly in favor of gentle mercurialization in these affections. It is, indeed, not at all improbable, that all the secondary consequences of gonorrhœa may be cured without this potent medicine; but many of the most experienced physicians of the present day believe that the gentle action of mercury very considerably expedites the radical removal of these affections. Mr. Travers, among other late writers, speaks decidedly in favor of mercurial remedies in cases of this kind. "The disadvantage," he says, "of slowness in the cure, and a continual tendency of the disease to relapse, or reappear in a new form, long since compelled me to abandon, as a general principle, that of treating these cases without mercury." The sarsaparilla should always be employed conjointly with the mercurials. In mild cases, Mr. Travers gives the compound decoction of sarsaparilla, "with free doses of the diluted nitric acid, with or without an equal portion of the tincture of henbane," and omits the mercurial remedies. Small doses of blue pill, with moderate doses of Dover's powder, form an excellent combination where there is much irritability present. I have, more generally, however, resorted to minute doses of corrosive sublimate, in union with the extract of conium, or opium, as recommended by Mr. Travers. This combination seems to be particularly useful where there is much disease in the fauces. In cases attended with much constitutional debility, Mr. Travers uses the *hydrarg. cum creta* with a small portion of rhubarb, or of Dover's powder.

Sect. II.—*Syphilis.*

The origin of syphilitic diseases is still involved in much obscurity. The general opinion of its having been introduced into Europe from South America, by the sailors who accompanied Columbus, admits of a great deal of doubt. Dr. Thomson, who has investigated this subject with much learning and discrimination, observes, that it "is extremely improbable that *sailors*, after a long and successful voyage, landing on the northern coast of Spain, objects of curiosity, ready to embark again to reap the fruits of their discoveries, and the wealth the new countries were supposed to abound with, should have been sent off to act as *soldiers* at the siege of Naples, laboring under a new and horrid disease, which must have been of some months' duration, and have incapacitated them for every kind of exertion. That neither Columbus himself, nor his brother, who left such accurate narratives of his voyage, should make the least mention of such disease being discovered among the natives, or prevailing among the crews of their vessels, is certainly still more difficult to be reconciled with reason, and affords strong presumption of error."† He thinks it probable that the disease has existed more

* [Authors have differed in their opinions respecting the occurrence of secondary symptoms after gonorrhœa. Many have spoken of the cotemporaneous and subsequent occurrence of a troublesome species of rheumatism which is called "gonorrhœal rheumatism," and most appear to believe in the papular form of venereal disease of Carmichael, which he ascribes as a secondary consequence to gonorrhœa. But the great authority of Ricord is decisively against the possibility of any secondary constitutional form of this disease. He attributes the supposed secondary eruptions, in all cases of gonorrhœa, to internal or concealed chancres, "*chancres larvees.*"—Mc.]

† Medico-Chirurg. Review, December 1821, p. 617.

or less, and under different grades of severity in all ages, and that "it has been thousands of times generated *de novo* by impure sexual intercourse." The circumstance which especially attracted the attention of physicians to the disease, about the period of its supposed importation into Europe, was probably its having assumed, at that time, an extraordinary degree of violence; for it is very evident, from the records of medicine, that the disease has varied very much since the first accounts that were given of its phenomena and character; and it is certainly very far from possessing the terrible severity now which it manifested during a long period after it was particularly noticed. It is not improbable, too, that the connection between primary ulcers on the genitals, and what we now call the secondary constitutional symptoms, was overlooked by the ancients: for as the former would very generally heal before the latter could make their appearance, and more especially as these constitutional affections were free from the power of infecting the healthy, they might very readily have been regarded as distinct diseases, wholly independent of primary sores on the organs of generation. Besides, although ulcers were abundantly noticed and described on these parts, their origin from impure venereal intercourse may have escaped detection. It is certain, at least, that Celsus describes various species of ulcers on the genitals; and it appears to me difficult to read his sections *De cancro qui in cole nascitur; De phagedena in cole nascente;* and *De carbunculo qui in cole nascitur*, without being impressed with the conviction, that he had reference to the various species of sores now known under the name of syphilitic cancer.

The opinion that syphilis is an ancient disease, but that it has been subject to various modifications from the influence of some occult cause in different ages, is strongly illustrated by the following account of the "new syphilitic disease which has lately appeared in Canada," in the last edition of Swediaur's valuable work on syphilis. "A new disease," says the writer, "broke out some time ago in Canada, especially in St. Paul's Bay. This disease has made rapid progress within these few years among the inhabitants of Canada. The parents transmit it to their children. It is communicated by eating, drinking, &c. If it once enters a family, rarely any one escapes catching it. Some habits seem to absorb the virus, and then sometimes it remains concealed or dormant for years, and then breaks out, at last, with all the symptoms of the third stage. The patients, often dragging out a miserable existence to old age, lose, by degrees, eyes, nose, cheeks, velum pendulum, and the whole basis of the skull, &c. They call it *mal Anglois*, (the English disease,) because they think the English brought it first among them." This accords with the violent and exceedingly contagious character which syphilis is said to have had during the first century of its ravages in Europe. It was communicated "by lying in the same bed, by the clothes, gloves, or money of the patient;" and even the breath was thought to be sufficient to communicate the disease; for it is stated that Cardinal Wolsey was indicted "for whispering in the king's ear while supposed to be laboring under the venereal disease." (Thomson, *loc. cit.*) Finally, it must be observed, that some of the earliest writers did not consider this affection in Europe as of transatlantic origin. Fracastorius ascribed it "to the different constitutions of heaven and stars, which but seldom happen, but may effect great matters when they do coincide;"* and he, as well as others, believed that it was one of those diseases which rise, cease, and again return, at long intervals of ages.† But although inquiries into the origin of the disease are highly interesting, and not altogether useless, the immediate scope of this work does not admit of an ex-

* Aphrodisiac, p. 202, as quoted by Van Swieten.

† Quam tamen (æternum quoniam dilabitur ævum),
Non semel in terris visam, sed sæpe fuisse,
Ducendam est: quanquam nobis nec nomine nota
Hactenus illa fuit: quoniam longæva vestustas
Cuncta situ involvens et res, et nomina delet;
Nec monumenta patrum seri videre nepotes.

tended discussion on this point, and I proceed, therefore, to the more practical details of the phenomena and modes of remedial management of this malady.

Syphilis, when suffered to proceed in its course, passes through two distinct stages or series of the phenomena; the first, or *primary*, which is altogether local;—and the second, or *constitutional*, in which the system generally becomes implicated in the disease.

Primary ulcers, or chancres.—At an uncertain period, varying from a few days to several weeks after an impure venereal intercourse, one or more small pimples, excoriations, or ulcers, preceded, usually, with an itching in the part, appear on some part of the genital organs, most commonly on the internal surface of the prepuce, the corona glandis, the glans, or on the frænum, and occasionally on the *external* surface of the prepuce, skin of the penis, scrotum or thighs in men; and in females, on the internal or external surface of the labia pudendi, on the clitoris, the nymphæ, in the vagina, or on the thighs.

Authors have of late years distinguished with great minuteness the primary venereal ulcers; and some have arranged them under distinct heads, ascribing to them specific differences, with the view, principally, of establishing certain indications in relation to the propriety of administering or withholding mercurial remedies for the prevention and cure of the secondary constitutional symptoms which may ensue. That there are divers local affections of this kind, is unquestionable. The observations of Hunter have long ago established this fact very conclusively; but it may be greatly doubted, whether the classifications and hair-splitting distinctions which have been announced as absolute and essential differences in the various ulcers of this kind, are entitled to our confidence, at least to the full extent to which they have been carried by some writers. Carmichael asserts, that there is but one of the four classes of the primary ulcers he describes —namely, the indurated and excavated chancre of Hunter—that is capable of giving rise to the true secondary symptoms of lues. This assertion, however, is by no means established on incontrovertible observations; for it may be affirmed, on the authority of competent testimony, that constitutional symptoms, differing in no material point from those which are regarded as truly syphilitic, may arise from various primary venereal sores, distinct from the excavated and indurated chancre. One thing, at least, is certain, that it is often extremely difficult, and sometimes impossible, to determine, from the appearance of the chancre, to which of the species usually described, it may belong; for in their external characters they sometimes pass into each other so insensibly—and the varieties of appearance met with in practice are so multifarious, that it will often baffle all our attempts to form a satisfactory diagnosis on this point. Even the unquestionable syphilitic chancre, so accurately described by Hunter, is liable to be confounded with other venereal sores, from these latter occasionally assuming the appearance of the excavated and indolent chancre.* Dr. Hennen, whose opportunities for carefully observing these affections were very extensive, confesses his inability to point out "any invariable characteristic symptoms, by which to discriminate the real nature of the primary sore." "It would," he observes, "be by no means difficult to show, that the high round edge, the excavated sore, the preceding pimple, the loss of substance, the hardened base and edge, whether circumscribed or diffused, and the tenaciously adhesive discharge of a very fetid odor, are all observable in certain states and varieties of sores unconnected with venereal

* [The experiments of Ricord, in Paris, have done more in the way of elucidating this subject than all former experience. He inoculates his hospital patients with the matter of all suspected sores, and produces a small pimple from the real virus, which can always be cured without any danger of being followed by secondary symptoms during the first eight days, by the application of solid caustic followed by a dressing of lint, dipped in aromatic wine. After eight days, the pustule or ulcer begins to show an indurated base or edge, and then there is danger of the occurrence of secondary symptoms. If allowed to progress, it afterwards assumes the characteristic appearance of true chancre, according to Hunter. After the period of induration, Ricord employs mercurials both topically and internally.—Mc.]

origin. The hardened edge and base, particularly, can be produced artificially, by the application of escharotics to the glans penis of a sound person; and if any ulceration or warty excrescence previously exists on these parts, this effect is still more easily produced."* Indeed, when we take into consideration the variety of textures which compose the parts upon which these primary sores occur, the diversity which exists in individual constitutions, and the various influences which are continually modifying the general habit of the body, we can readily conceive that sores, even from the same virus, must be liable to very different aspects in different individuals.

In making these remarks, I would by no means wish to be understood as regarding all distinctions of this kind as unfounded or nugatory; but to attempt to classify these primary venereal sores as fixed and essential diversities, merely from their external characters, and to propose them as indications for the employment or rejection of particular remedies, appears to me obnoxious to very serious objections.†

In relation to the diversities which occur in the primary as well as the secondary venereal affections, it must, in the first place, be observed that there are two distinct classes of these maladies, namely: 1. *Genuine lues* or *syphilis*, for the cure of which mercury is indispensable; and 2. Venereal affections, often closely resembling, though differing essentially from the former, and which may, *in general*, be cured without mercury.

I. The *true syphilitic chancre* is thus described by Mr. Hunter:—"The sore is somewhat of a circular form, excavated, without granulations, with matter adhering to the surface, and with a thickened edge and base. This hardness and thickening is very circumscribed; not diffusing itself gradually and imperceptibly into the surrounding parts, but terminating rather abruptly." When examined, by pressing the chancre between the fingers, it will be found that the whole excavated surface of the ulcer is surrounded by a hard or indurated basis. In some instances, a small indolent ulcer is seated, as it were, in an indurated knob on the glands; and occasionally indurated tubercles passing deep beneath the surface, with scarcely any visible ulceration, will be followed by constitutional symptoms of syphilis—but in cases of this kind, "we will probably learn, a small ulcer existed at first on the callous part, which healed under the use of some local application." (Carmichael.) When the syphilitic chancre is situated on the body of the penis, it presents a dark livid color, without being scooped out or excavated, and the surrounding parts are less indurated than when it occurs on the glans penis. True syphilitic chancre is always of an indolent character—very slow in its progress. The excavated and circumscribed state of the ulcer, its indurated edges and base, and its slow progress, constitute the characteristic marks of the syphilitic chancre: but it must not be forgotten, that almost any sore situated on the glans penis is apt to acquire a more or less indurated condition from being frequently irritated by improper applications; and hence, in forming a diagnosis, we should always take into consideration the previous management of the ulcer." (Carmichael.)

The *constitutional symptoms* which proceed from the true syphilitic chancre, appear first upon the skin, the throat and mouth; and finally upon the periosteum, bones, and deep-seated parts. The true syphilitic eruptions appear in distinct circular patches, from a few lines to half an inch in diameter. They are slightly raised, and covered with thin, whitish, hard scales, easily separated, leaving smooth, shining, *copper-colored* spots, somewhat elevated above the surrounding skin. In some instances a small white band encircles the base of each disk; and occasionally several of the spots unite, forming large irregular copper-colored

* Principles of Military Surgery, &c., p. 517.

† "It is not," says Swediaur, "by the external characters alone that we can discover the nature, and distinguish the different kinds of ulcers alluded to; to inspection and practical knowledge, we must join a profound acquaintance with the diseases, an attentive examination into the actual state of the patient, his constitution, and the remedies and regimen which he has adopted."

patches, with portions of scales adhering to them. These scaly copper-colored spots are sometimes in a great measure confined to the forehead, neck, breast, forearms, legs, and anterior part of the abdomen. Syphilitic eruptions occasionally appear in the palms of the hands and soles of the feet, presenting a very peculiar aspect—namely, masses of dry friable scales, very easily removed, and exposing spots of a livid color, with an indurated state of the skin and subjacent structure.

When the syphilitic patches are situated on parts opposed by another skin—as between the nates, under the arms, between the thighs and scrotum, &c., they do not present a dry and scaly appearance; but an elevated, soft, moist, and flat surface, discharging a thin whitish matter. Sometimes the upper part of the extremities of the fingers and toes become affected, and the nails are gradually separated.

If the disease is not opposed by the employment of mercury, "every succeeding scurf which is formed becomes thicker than the preceding, till at length it forms a crust, under which matter collects, and it becomes a true ulcer." These ulcerations spread very slowly.

After the eruption has made more or less progress, *the throat also becomes ulcerated*, generally about the tonsils and soft palate. These ulcerations are not preceded by much inflammation or swelling, and the tonsils exhibit ulcerated cavities with well-defined edges, similar to the primary syphilitic ulcers on the glans penis. As the disease proceeds, the *periosteum*, the fasciæ, ligaments and *bones* become affected; and of the bones those nearest the surface, as the cranium, clavicle and sternum, are most liable to become the seat of its destructive ravages. "The true syphilitic *node* is a solid enlargement of the bone," unaccompanied, during the earlier periods of its progress, by any discoloration of the skin, nor is there much pain, until it has arrived at a considerably advanced state.

II. Of the non-syphilitic venereal sores, and in which mercurial remedies are, in general, unnecessary, and often injurious, the following are the principal varieties:—

1. *Venerola vulgaris**—or the *simple primary venereal ulcer* of Carmichael. This is by far the most common variety of venereal ulcerations. The simple venereal ulcer commences from three to seven or eight days after the impure sexual connection, by an itching or redness, which is speedily succeeded by a small pustule surrounded with a red margin. In a few days the pustule becomes converted into a thin crust, under which more or less matter collects, and gives rise to considerable pain. The scab gradually enlarges, and acquires a triangular or circular shape, varying in color from yellow to dark brown. This scab soon separates, and exposes an excavated, round, or oval ulcer, with a glossy reddish or dirty yellow color, surrounded by a narrow red areola. The bottom of the sore now begins to fill up; it rises above the level of the surrounding parts, and exhibits a smooth surface, seated on a fungoid basis, without granulations, and of the color of a healthy sore, the base and edge being usually a darker red than the disk of the sore. Between the fourteenth and fifteenth days, the ulcer generally has risen to its greatest height; but the process of ulceration, as well as the surrounding efflorescence, generally ceases as soon as the fungoid stage commences. In some instances, the top of the elevated sore extends beyond its base over the surrounding sound skin, giving it the appearance as if a ligature were tied about it beneath the surface. In this state the sore remains stationary for some time, and then gradually and usually slowly declines and heals, the average period of the commencement to the termination of the ulcer occupying from four to six weeks. "Wherever may be the seat of these ulcers, on the inner part of the prepuce, their characters are seldom doubtful after the ninth day; for by drawing the skin well back, and making allowance for the form of the parts, the raised

* Pathological and Practical Remarks on Ulcerations of the Genital Organs. By James Evans, Surgeon, &c. &c.

edge and surface cannot escape discovery; for although these may not be plainly discernible all around, they will be so on some one side." (Evans.) These ulcers are particularly apt to excite phimosis, and are frequently accompanied with patchy excoriations on the glans and prepuce, and occasionally with a profuse gonorrhœal discharge.

The *causes* of *venerola vulgaris* consist of gonorrhœal matter and of other morbid vaginal secretions communicated by the sexual intercourse. With this variety of venereal ulcerations we may place the "*patchy excoriations*" already mentioned, for they proceed from the same cause, and may exist either conjointly or separately.

Secondary or constitutional symptoms sometimes succeed or attend this variety of primary venereal ulcers; but these are always mild, and readily disappear under mild aperient and diaphoretic treatment. These symptoms consist in slight febrile excitement, attended with headache, and aching pains in the joints, and occasionally also in the chest, succeeded by a *papular eruption* on the forehead, chest, and back, and scattered more thinly over the extremities. Fresh crops of these papulæ appear, at the same time that the slight febrile irritation and nocturnal pains in some of the joints continue. "The papulæ vary from a pale red to a deep crimson color," some of them preserving the character of pimples, whilst others are more of a pustular form. They may appear from five weeks to three or four months after the infection. When they are about declining, they become paler, and often assume a copper tint, "while the exfoliation of the cuticle gives them an appearance of scaliness"—a state in which they may be confounded with the scaly eruption of true syphilis. "But they may be readily distinguished from each other; for when the papular eruption is on the decline, and has assumed a pale-red or copper color, on examining the patient we shall find other spots in their papular or pustular form, which will at once point out the character of the eruption." (Carmichael.)

The fauces generally become affected, but not with excavated or spreading ulcers. The patient complains of soreness on swallowing; and on looking into the fauces, the entire cavity exhibits a red and œdematous appearance, with swollen tonsils.

2. *Venerola superficialis* of Mr. Evans, *or the primary ulcer of the pustular syphilitic eruptions* of Carmichael.—This variety begins with a small pustule, which soon breaks, and forms a crust, under which the cuticle ulcerates in a circular or oval form. When the crust separates, it exposes an ulcer of a reddish-brown surface, on a level with, or somewhat elevated above, the surrounding skin, with *raised and well defined edges*. It is free from marginal or surrounding induration, of a granulated appearance, and seldom attended with considerable pain. It varies from the size of a pea to that of a shilling; but when neglected or improperly managed, it sometimes increases to a much greater extent. It occurs most frequently on the external surface of the prepuce and body of the penis, and is sometimes met with on the anterior aspect of the scrotum. In some instances this variety of ulcer surrounds the orifice of the prepuce, and occasions, when the ulcer heals, a permanent phimosis. It is generally tedious in its progress, and does not manifest any tendency to spread. This ulcer has not the smooth fungous appearance of the former variety, and is strictly defined in its circumference. Venerola superficialis, when left to itself, is almost invariably followed by constitutional symptoms. These consist *usually* of a *pustular eruption* coming out in succession, and terminating speedily in scabs and superficial sores, so that "at the same time, on the same individual, there will appear some new formed pustules, and others in their scabbing stage, with an intermixture of small ulcers, whose crusts have fallen off, and of discolored patches of the skin, where they have healed." Considerable inflammation and ulceration of the tonsils and pharynx, attended with pains resembling acute rheumatism, are particularly apt to follow this variety of primary ulcer. Mr. Evans asserts that he never met with an instance that was not followed by secondary

symptoms. Mr. Carmichael thinks that this variety of venereal disease forms "the natural link between the simple ulcer and its consequences, and the phagedenic venereal disease."

3. *Venerola indurata*, or the *indurated sloughing* primary ulcer.—This variety of venereal ulcer is characterized by great derangement of the general health, much inflammation of the part, local pain, a strong tendency to sloughing or destruction of the parts, and by a cartilaginous induration of the base, unless seated on the glans. The situation of this sore is frequently at the duplication of the prepuce behind the corona glandis, in which case the ulcer generally *burrows* deep between the skin and the body of the penis. When it is situated on the internal surface of the prepuce, which is very common, the peculiar hardness of the base is very remarkable; and the surface of the sore, whether seated on the prepuce or glans, presents a dark liver-colored slough, "which falls off, and is succeeded rapidly by other sloughs, destroying the parts rather in depth than in breadth." (Bacot.)* When the general and local inflammatory action is very severe, mortification to a greater or less extent is by no means uncommon. Mr. Evans says, that he has "known gangrene to take place as early as twenty-four hours after the appearance of the disease, and in less than seventy-two hours after the venereal connection. When these sores heal, they are apt to leave indurated spots, which are peculiarly disposed to ulcerate again from irritation, or want of cleanliness." (Evans.) This variety of sloughing ulcer is distinguished from the phagedenic ulcer by the presence of the indurated base. The constitutional symptoms commonly show themselves at a very early period, even before the active progress of the ulcer is completely arrested, and do not differ materially from those which succeed the next variety—namely:

4. The *phagedenic primary ulcer* of Carmichael.—This ulcer exhibits an irregular, corroded appearance, without granulations and surrounding indurations. It sometimes spreads rapidly, and causes extensive destruction of the parts in a few days. Sometimes it "creeps on slowly, healing in one part and making progress in another." The internal use of mercury very generally renders its course more rapid and destructive. It is usually seated on the glans near the prepuce, which "it often entirely consumes, and continuing its depredations on the corona and glans, at last effects their total destruction. When this event takes place, the ulceration usually receives a sudden and permanent check; but in some instances, profuse hemorrhage occurs before the glans is entirely destroyed, in which case a favorable change usually takes place in the ulcer. Occasionally, though indeed rarely, the disease slowly proceeds until the whole penis is destroyed." (Carmichael.)

It is highly probable, as Dr. Emerson observes,† that the last two varieties of venereal ulcer owe their characteristic phenomena "more to circumstances of climate, constitution, and habits of the patient, than to a peculiar or distinct specific virus." Of this, indeed, I do not in the least doubt. "A southern climate predisposes most to these forms of primary syphilis, which are comparatively rare in the more northern and temperate latitudes. In the south of Europe, the predisposing causes seem to be far more active, and particularly so in their operation upon northern visitors. The crews of our men-of-war and merchantmen have occasionally suffered very much from this form of syphilis in the Mediterranean, especially on their visits to the Italian and Spanish ports." Persons of a scorbutic and irritable habit—and especially those whose constitutions have been impaired by breathing an unwholesome atmosphere, or by a spare and unwholesome diet, or finally, by long residences in hot climates, are most liable to the sloughing and phagedenic varieties of venereal ulcerations. (Evans, *loc. cit.*, 109.)

* Observations on Syphilis, principally with reference to the use of Mercury in that Disease. By John Bacot, Member of the Royal College of Surgeons, &c.

† See his edition of Carmichael's work on Venereal Diseases. Philadelphia, 1825, p. 164.

According to Carmichael, the secondary constitutional symptoms of the last two varieties of primary ulcer are: tubercles, pustules, or spots of a pustular tendency—degenerating quickly into ulcers, with thick scabs, healing usually from the centre, while the ulceration spreads along the circumference. Strong fever often ushers in this eruption; but in many cases a general feeling of indisposition, of listlessness, pallid countenance, languid eye, and broken rest, precede for several days the appearance of the eruption, unaccompanied by distinct febrile movements. In other instances, "nocturnal headaches, tenderness of the scalp, slight dyspnœa, with soreness of the sternum and of the breast, generally occur previous to the appearance of the constitutional symptoms." *Phagedenic ulcerations* in the throat, tending to destroy the pharynx; the spongy bones of the nose; soft palate and tonsils; *severe and obstinate pains in the joints*—particularly of the knees and wrists; and obstinate *enlargement of the testes*, are among the most common constitutional affections from primary ulcers of this kind. When the ulcers in the throat extend into the larynx, which is not very uncommon, "there is but little chance of saving the patient's life." This occurrence is announced by "a whispering, stridulous voice, constant cough, and copious expectoration of viscid matter; restlessness, great anxiety of countenance, emaciation, night sweats, rapid pulse, and all the concomitants of phthisis."

Treatment.—In perusing the various writers of acknowledged authority on this subject, it would seem almost impossible to come to any satisfactory conclusion as to the proper mode of treating both the local and general symptoms of this malady. All indeed agree, that in genuine syphilis, mercury is indispensable to the removal of the disease; but this forms but a small portion of the great number of venereal cases met with in practice, and it is moreover admitted, and very justly, too, that it is frequently almost impossible to determine, from the external character of the disease, whether it be true *lues*, or only one of the various venereal affections which have been described. Some writers condemn the use of mercury, without exception, in the various non-syphilitic venereal affections; others admit its utility in certain varieties and under certain conditions, but they disagree among each other as to the particular varieties and circumstances which call for its employment. Others, again, less scrupulous in the use of mercury, affirm that, with very few exceptions, and under cautious management, it may be used not only safely but very beneficially, in almost every variety of primary and secondary venereal affections.

The result of all this disparity of opinion would seem to be that there is "a proper medium," in relation to the employment of mercury in affections of this kind; and that the entire rejection of its aid is just as apt to lead to disastrous consequences, as its indiscriminate and universal employment. Mr. Bacot observes, that "with the exception of the sloughing and phagedenic venereal sores, the exhibition of mercury, in the majority of primary ulcers, is so safe and so generally beneficial, that where a sore of this kind continues for a certain time to pursue its course, and to resist all those mild methods of cure, both external and internal, which influence the progress of sores in other parts, I should not hesitate to have recourse to its exhibition." In reference to the late discussions concerning the non-mercurial treatment of venereal affections, this experienced writer makes the following observations, to the correctness of which I am entirely disposed to subscribe. "It is assumed, therefore, as an established fact, that all ulcers upon the parts of generation are curable without the use of mercury; but I cannot concede that, generally speaking, they are cured with equal celerity: they require more strict confinement; more attention to the state of the general health and to regimen, than is found necessary under a mercurial treatment carefully conducted; and in some instances, the length of time requisite for their complete cicatrization is alone a serious evil. It may also be added, that under the non-mercurial treatment, they frequently heal with hardened and elevated cicatrices." It must be admitted, moreover, that a much greater proportion of cases are followed by constitutional symptoms, when the primary stage is treated

without mercury, than where a cautious exhibition of this mineral is resorted to. "From these circumstances, therefore," says Mr. Bacot, "I would advocate the moderate and gentle use of mercury in all those cases of primary sore, where a mild mode of local and general treatment is productive of no beneficial change in the course of a reasonable period; *at the same time being perfectly prepared* to do without it in all those cases and in those constitutions where its employment appears to be pernicious, being convinced that it is both much wiser and more safe to postpone the exhibition of this remedy where the habit is irritable, and it appears to operate upon the system as a poison only, calling into action that peculiar and anomalous class of symptoms usually called *cachexia syphiloida*." (*Loc. cit.*, p. 35.)

Mr. Hennen observes: "In every primary ulcer, I would give up the idea of using mercury at first, treating it as if it were a simple ulceration, by cleanliness, rest, and abstinence, and applying to it the most simple and mildest dressings. If the sore did not put on a healing appearance in a reasonable time, the extent of which must depend on the circumstances of the patient, I should make use of more active dressings. But if beyond all calculation it remained open, I should certainly sacrifice every dislike to mercury, knowing how many persons have been seriously benefited by a judicious and mild administration of that remedy." These sentiments appear to me unexceptionable, as general precepts, and I have for five or six years uniformly treated the cases that have come under my care in conformity with them. It will be proper, however, to give a more particular detail of the management of the various primary ulcers. The *simple venereal ulcer—venerola vulgaris*, usually runs its course in spite of remedial applications; and where the irritation is not considerable, nothing but the lightest emollient dressings are necessary, so long as the scab has not separated and exposed the fungoid and raised surface of the ulcer. Warm emollient poultices should be applied until the crust comes away, when the ulcer is on the external part of the penis; when the ulcer is seated on the inner surface of the prepuce, a piece of linen kept constantly moist with a weak solution of lead should be laid over the part; and when phimosis attends, the same liquid should be frequently injected with a syringe between the prepuce and glans. When the scab separates and exposes a raised and fungous ulcerated surface, nothing in general answers better than the application of a weak solution of the sulphate of copper, (in the proportion of about four grains to an ounce of water,) two or three times daily; and in the advanced stage of the complaint, the same may be injected under the prepuce, if phimosis attends. I have derived much benefit in the fungoid state of this variety of venereal sores, from the application of citrine ointment softened down with an equal proportion of lard. The *aqua phagedenica*—made by dissolving eight grains of corrosive sublimate in four ounces of lime water, or a very weak solution of lunar caustic, may also be usefully employed. All such applications, however, should be weak; for the object is not to destroy the raised surface of the ulcer by an escharotic, but simply to stimulate it. Mr. Carmichael recommends the zinc ointment, either alone or mixed with a third or fourth part of the citrine ointment. During the early stage the patient should use a light, unirritating diet, remain quiet, take mild aperients; and where the constitutional irritation is considerable, venesection and perfect quietude in bed are proper.

When phimosis attends, emollient poultices, efficient blood-letting and nauseating doses of antimony should be resorted to. Sometimes the attendant inflammation terminates in the formation of matter under the ligament of the penis. In this case the tension and pain are excessive and obstinate—the skin becomes discolored, but, from the extreme tension of the part, no fluctuation can be felt. The excessive pain, induration, tension, and obstinacy of the affection, are the only circumstances by which the formation of pus under the ligament can be inferred with sufficient confidence. If the matter is not evacuated by a free incision into the dorsum penis, it usually makes its way up the dorsum, and escapes by an ulcer near the pubis.

Venerola superficialis, or the primary superficial ulcers with elevated and perfectly defined edges, are seldom benefited by stimulating and caustic applications; but often rendered much worse. Moderately astringent and soothing applications are in general beneficial—such as weak solutions of sulphate of zinc, sugar of lead, althea or tutty ointment. When the constitutional irritation is very considerable, the lancet, purgatives, antimonials, nitre, and other refrigerant diaphoretics, with local, emollient, and sedative applications, will be necessary. The internal use of mercury generally renders the progress of primary ulcers with elevated edges, extremely obstinate. "I have frequently," says Mr. Carmichael, "seen mercury, exhibited in full doses, maintaining a strong mercurial action in the system for several months, without inducing ulcers of this kind to heal."

In the *indurated sloughing ulcer*, where there is much surrounding hardness, and the surface of the sore covered with a dark liver-colored slough, from which a thin dark-colored ichorous fluid issues, mercury, according to the experience of Mr. Bacot, is decidedly beneficial, until the hardness of the surrounding parts disappears. It does not appear, however, that the most careful administration of this medicine is capable of protecting the constitution from the secondary symptoms; but when the copper-colored eruption has once made its appearance, "it is as much under the influence of mercury as the primary sore"—disappearing in general without difficulty under the moderate employment of this remedy. When the constitutional irritation is high, attended with an evident disposition to gangrene, great anxiety, heat and dryness of the skin, furred tongue, and much pain and swelling of the prepuce, vigorous antiphlogistic measures must be adopted. The lancet, cathartics, antimonials in nauseating doses, cold applications, and a rigorous antiphlogistic treatment, are indispensable in such cases, and the patient should remain in bed. When the local and general inflammatory action is moderated, and the system is much debilitated, recourse should be had to tonics—particularly quinine and opium; and the separation of the sloughs may be promoted by warm and emollient poultices. Mercury can only be safely employed where the surrounding inflammation and pain are moderate. The sores must be dressed with mild applications—such as weak solutions of acetate of lead, or a solution of sulphate of copper, in the proportion of two grains of the sulphate to an ounce of water, or the black lotion (calomel ℈i, lime water ℥vi).

The *phagedenic, soft, sloughing primary ulcer*, free from very conspicuous surrounding hardness, is often especially unmanageable. The most prompt and vigorous antiphlogistic measures are necessary to arrest the progress of the ulceration; but *the employment of mercury in this variety of primary ulcer is almost invariably pernicious, "and often productive of the worst consequences."* (Bacot.) The measures to be confided in, during the inflammatory stage, are: rest in a recumbent posture; venesection; nauseating antimonials; warm fomentations injected under the prepuce, or applied by stuping; warm emollient poultices; together with the internal use of opium, hyoscyamus and cicuta. When the violence of the inflammation and the active progress of the ulceration have been moderated, and the ulcer "creeps slowly along," healing in one place while it advances in another, *a weak solution of the nitrate of silver*, (one, two, or three grains to an ounce of water,) "or the *black* or *yellow mercurial washes*, do well in some cases; but in some cases no applications seem to be capable of checking the progress of the ulceration." (Carmichael.) If spontaneous hemorrhage ensues in obstinate cases of this kind, an immediate check to the progress of the disease is usually the result. Mr. Carmichael states, that he has in some instances derived decided advantage from "paring off the irregular and jagged superficies of the ulcer, and encouraging the bleeding afterwards by immersing the part in warm water." When a band or strip of integument connects one portion of the ulcer with another, or the ulcer has penetrated through the frænum, leaving its anterior part attached to the glans, and the disease has assumed a chronic state, it will be proper to divide it by an incision.

In sloughing ulcers, without indurated bases, we may often derive much benefit

from stimulating applications. Carmichael particularly recommends Venice turpentine, or balsam copaiva, mixed with one or two parts of olive oil. I have known very prompt advantage derived in sloughing ulcers of this kind, from the application of poultices made of crumbs of bread and a strong decoction of *oak bark*. A lotion of one part of the tincture of myrrh to seven parts of camphorated mixture, may also be very beneficially applied where the sloughs are extensive. (Carmichael.) A pure air is all-important in the management of this variety of venereal sores.

The *true syphilitic chancre*.—When early resorted to, the excision or destruction of the chancre with caustic, will frequently arrest the further progress of the local affection, and prevent the occurrence of the secondary constitutional symptoms. This practice is, however, not always free from unpleasant consequences; for although the sore may be thus speedily healed, buboes will occasionally appear; and the virus is sometimes confined under the eschar produced by the caustic, and corrodes the parts underneath, so as to form a deep ulcer. In irritable and depraved constitutions, too, the irritation produced by the caustic is apt to give rise to very injurious consequences. Swediaur asserts, that he has seen "the most dreadful symptoms produced by this application." Although mercury is unquestionably our only means for counteracting the formation of secondary affections, it does not appear to possess any especial controlling power over the primary local affection. Nevertheless, as it is of much importance to protect the system against the occurrence of a general syphilitic taint, it will be proper to put the patient, at once, under the use of a gentle mercurial influence, in conjunction with proper local applications to the chancre, unless the primary sore be irritable, and the general system inflammatory, or of a manifestly depraved or scorbutic habit. When these contra-indicating conditions to the employment of this remedy exist, measures must be previously taken to remove the irritable and phlogistic state of the system by pure air, diaphoretics, opium and laxatives. Most of the recent writers recommend the mildest local applications—simple ablution to keep the parts clean, and dressing the chancre with dry lint, or the most soothing ointments; and in the majority of instances, these will be found better than the irritating applications formerly so much employed. Swediaur, however, is a strenuous advocate for the employment of the red oxide of mercury mixed with lard, as a local remedy for syphilitic chancre. He also speaks very favorably of the effects of "finely powdered corrosive sublimate, mixed with a little saliva, and rubbed for five or six minutes, once or twice a day, on the ulcers. These remedies, (he asserts,) are generally highly useful, notwithstanding the assertion of modern writers." To sum up all, he says, "I am of opinion that mercury, topically applied, is never injurious in syphilitic ulcers; but on the contrary that it is extremely serviceable, and almost sufficient to effect a cure, when the ulcers are local, and arise from a primary disease; lastly, that it is always necessary when the progress of the disease is rapid and alarming." I have repeatedly resorted to applications of this kind with very satisfactory results, although, in general, I have abstained from them until the system was put under a moderate mercurial influence. My usual mode of proceeding is to destroy the chancre with lunar caustic, when I am consulted during the first five or six days after its appearance; but when the chancre has already made considerable progress, I at first simply keep the parts clean by frequent ablution, and direct it to be dressed with simple cerate; as soon, however, as the system is moderately impregnated with mercury, I destroy the callous edges of the chancre with caustic, and direct the sore to be dressed with red precipitate ointment; or to be touched frequently, during the day, with a solution of the sulphate of copper (four grains to an ounce of water); or finally, to be washed repeatedly with the black mercurial lotion. The mercurial impression should be kept up for six or eight weeks; but it is of the utmost importance that the patient should avoid a damp and cold atmosphere, and that he should be particularly cautious to keep up an equable action of the skin by warm clothing. He should use a mild and unirri-

tating diet, and abstain wholly from the use of stimulating drinks. During damp and variable weather, there is great risk of receiving injury from cold, while the system is under the mercurial influence; and to avoid this accident, the patient should, if possible, remain within doors.

The *treatment proper for the removal of the constitutional venereal symptoms* has been particularly a field of much contention—all turning upon the point, how far *mercurial remedies* may be necessary or injurious in the management of these affections. It is now, however, very generally admitted, that in what are termed the *pseudo-syphilitic* symptoms, the employment of this potent remedy may often be very properly dispensed with—that it is calculated, under certain circumstances, to do much injury, and that in no instance is it necessary to carry its employment to the great extent which was formerly so indiscriminately and generally practised. Nevertheless, we may, upon good grounds, I think, refuse to join in the hue and cry set up against the employment of mercury in venereal cases—for there is much reason to believe that many of the baneful consequences which have occurred from its administration, have proceeded rather from its *abuse* than its *use*, or from accidental influences contravening its salutary influence. The most violent declaimers against mercury are those who have practised in hot climates—and in military and other hospitals, and generally among patients whose previous modes of living were such as to deprave the general constitutional habit—all of which circumstances are certainly very well calculated to interfere with the salutary operation of this remedy, and to convert it often into a decidedly deleterious agent.

It must be admitted that the various forms of constitutional venereal affections may, in general, be ultimately removed by a long course of the usual diaphoretic ptisans, proper regimen, and other simple measures calculated to improve the general health of the system. This is more especially practicable, so long as the secondary symptoms are confined to the skin and throat; but even in this stage of the progress of such affections, the moderate and gentle use of mercury will almost always greatly expedite the cure, and in some instances will be found indispensable to the entire eradication of the malady. Although very generally a mild mercurial influence, regularly sustained, will be sufficient to procure all the benefits that may be derived from this remedy, yet instances do sometimes occur, which, after a long course of gentle mercurial action without any permanent advantage, will readily yield to a full salivation. About four years ago, I met with a striking illustration of this fact. The patient had for three years labored under secondary venereal symptoms, which were the consequence of a phagedenic primary ulcer. He had undergone three moderate, but long-continued mercurial courses with only very temporary benefit, and during the eight months immediately before I saw him, he daily took the sarsaparilla decoction and syrup—of the latter of which he had already taken above forty bottles. His nose and the internal fauces were much ulcerated, and various painful swellings on the ulnæ, tibiæ, and cranium, had reduced him to a most distressing condition. I put him immediately upon the use of large and repeated doses of calomel, and confined him to his bed. In five days very profuse ptyalism was induced, which was kept up for two weeks, and then left to subside gradually under the use of sarsaparilla infusion. In six weeks he was entirely cured, and he has since enjoyed, apparently, a perfect state of health.

The *papular* form of venereal eruption will very generally disappear under the use of antimonials and sarsaparilla, with a mild and unirritating regimen, aperients, the warm bath, and the avoidance of a variable, damp, and cold atmosphere. Nevertheless, where this eruption continues obstinately, and the patient's strength declines, recourse should be had to mercurial remedies, which will rarely fail in a short time to manifest a most beneficial effect.

The *tubercular eruptions* which usually appear on the eyebrows, forearms, back, and hairy scalp, and which at last become converted into irregular crusts, leaving ragged, ill-looking ulcers, of a glassy, shining, and level surface when

they separate, are in general much improved by a mild mercurial course, employed after the general phlogistic symptoms, which usually usher in the eruption, have been reduced by venesections, antimonials, aperients, diluent drinks, &c. Carmichael recommends the free use of the decoction of sarsaparilla and antimonials in this variety of the disease; and where the secondary ulcers are extensive and irritable, with phagedenic edges, the use of free doses of cicuta, in conjunction with the compound decoction of sarsaparilla, is often highly beneficial. The internal use of nitrous acid, too, is sometimes very efficacious, where the tubercles spread in foul and irregular ulcers; and it may be very conveniently given in union with the sarsaparilla. Although Mr. Carmichael advocates the non-mercurial mode of treating this and some other varieties of secondary venereal affections, he "does not wish to be understood as wishing to exclude the use of mercury altogether, for the cure of this most formidable of venereal complaints." It is against the *abuse*, not the use of this remedy, he contends. The fact appears to be, that where, from idiosyncrasy, or a peculiar, irritable, and scorbutic condition of the system, the operation of this remedy is not diverted from its ordinary salutary effects, it may in general be employed with as much advantage in this as in any of the other forms of secondary affections. Mr. Bacot asserts it as his conviction, that the tubercular variety of eruptions, with its consequent ulcerations, is, in general, "strikingly benefited by the mild employment of mercury."

Without, however, extending these observations as to the particular circumstances under which the employment of mercury may be proper or improper, it will be sufficient to observe, in a general way, that in all instances where the cutaneous and other secondary symptoms do not yield in a reasonable course of time to the use of sarsaparilla, the compound decoctions of the woods, antimonials, rest, an equable temperature, and simple and unirritating diet, recourse should unquestionably be had to a more or less active course of mercury. Where the constitutional symptoms are attended with much general irritation or febrile excitement, the use of mercury ought to be delayed until the general phlogistic and irritable habit of the body has been moderated by the use of the measures just indicated. It should also be particularly borne in mind, that where the ulcerations in the throat are attended with high inflammation and swelling, mercury cannot in general be safely administered until this local inflammatory condition has been moderated by general antiphlogistics, emollient gargles, the inhalation of aqueous vapor, perfect rest, low diet, and nauseating antimonials.

In instances attended with an irritable habit of body, much advantage will usually result from the employment of opium or hyoscyamus in conjunction with mercurials. This combination is more especially necessary in cases attended with much pain in the extremities or bones, and where the mercury seems to augment the general irritation. So far as my own limited experience has enabled me to judge, I am well satisfied that the regular employment of full doses of Dover's powder will in general very materially enhance the good effects of mercury, under almost every variety and circumstance of the disease.

One of the most important observances in the employment of this remedy, is the rigid avoidance of a cold, damp, and variable atmosphere. If the patient can be induced to remain in his room, which should, however, be kept perfectly clean and well ventilated, and at a uniform temperature, the beneficial influence of the mercury will be much more certainly obtained than when he walks about in the open air, unless the weather be warm and dry. The diet, too, should be of the lightest and least irritating kind, and every sort of stimulating drink must be especially interdicted.

It has already been stated, that in the commencement of the constitutional symptoms, it often becomes necessary to employ measures for the reduction of the general phlogistic habit, before mercurial remedies can be with propriety resorted to. It may also be observed, that even in inveterate cases, the use of aperients, the warm bath, and especially the compound decoction of sarsaparilla,

continued for three or four weeks, are often decidedly useful preliminary measures to the employment of mercury.

With regard to the extent to which the mercurial action is to be carried, no precise rules can be laid down for the management of secondary venereal affections. It is admitted, nevertheless, that it seldom becomes necessary to induce full ptyalism—a moderate and equable action, maintained for a considerable length of time, being commonly sufficient to procure all the advantages that can be derived from this remedy. To this, however, exceptions will occur; and where the disease does not yield under the combined influence of an alterative course of this medicine, and the usual diaphoretic or depurative ptisans, we ought certainly to push the mercury to the full extent of its influence, where no symptoms or circumstances exist which seem to contra-indicate its vigorous employment.

Some difference of opinion prevails as to the preparation of mercury most eligible for the treatment of venereal affections. In recent cases, the blue pill, with or without ipecacuanha, is generally preferred. In chronic syphilitic affections of every form, I have scarcely ever employed any other mercurial than the corrosive sublimate, in doses of from one-eighth to one-sixth of a grain, with two grains of the extract of cicuta, three times daily.

Professor Zondi has, within a few years, published a new mode of using mercury in chronic venereal complaints, which I have known employed in two instances with extraordinary success. He makes one hundred and twenty pills out of twelve grains of corrosive sublimate, and directs them to be taken in the following way: On the first day one is taken; on the second none; on the third two; on the fourth none; on the fifth three pills; and so on, increasing the dose by one pill every other day, and omitting them on the intervening days, until they are all taken, by which time the cure is completed. During the treatment, infusion of senna is to be taken, so as to keep up a regular action of the bowels, and the patient is restricted to half the ordinary quantity of his food, and is permitted to leave his house only during very fine weather. About two years ago I saw this plan of treatment put in practice with complete success. The patient was affected with venereal nodes and caries, with ulcers on different parts of his body, and had been long wholly unfit for any kind of employment. I had him under treatment for six months; in three of which he used the compound decoction of sarsaparilla, and the last three months he was under an alterative course of mercury, without deriving any particular benefit from all I prescribed. He was then admitted into the Pennsylvania Hospital, and underwent two full mercurial courses, but he came away without being in the least relieved. My friend, Dr. Mœring, had expressed to me a wish for a proper subject to put Zondi's mode of treatment to a fair trial. I took him to this patient: he prescribed the corrosive sublimate in the above way, and in five weeks the patient was relieved of all his symptoms; and he is now perfectly healthy, and has made several long voyages since he underwent the treatment.

The *proto-ioduret of mercury* has, recently, been strongly recommended as a remedy in syphilitic affections. M. Biett prescribes it according to the formula given below.*

Sarsaparilla and *guaiacum* in the form of a ptisan, are without doubt highly valuable remedies in the treatment of venereal affections; and in conjunction with antimonials, a simple diet, warm bathing, and aperients, will often remove the milder forms of the disease without the aid of mercury. Although I should

* ℞.—Proto-ioduret of mercury ʒi.
Powder of marshmallows ʒi.—M. Divide into 72 pills.—Or,
℞.—Proto-ioduret of mercury ℈ii.
Thridace ʒss.
Extract of guaiac, ʒi.—M. Divide into 48 pills. He commences with one pill a day, for the first three days, and gradually increases the number to three or four a day—never more than one, however, at a dose. He orders at the same time some alterative infusions.

not be disposed to depend solely on these means, yet the *sarsaparilla* infusions in common use can hardly be omitted with propriety, in conjunction with mercurials, in the cure of such affections. A great variety of formulæ have been proposed for preparing these ptisans, but the following are acknowledged to be among the most effectual.* An excellent mode of administering mercury is to give it in solution in a ptisan of this kind.

As a local application to the chronic and foul ulcers which occur in some instances on different parts of the body, as well as to those which are seated in the fauces, the black or yellow mercurial washes, or a weak solution of blue vitriol, will in general answer a very good purpose.

Although mercury is unquestionably the most important remedy we possess, for the cure of syphilis and certain syphiloid affections, there are several other articles highly worthy of attention as means for removing diseases of this kind. Among these, *gold* appears to be the most valuable. I have employed the *muriate of gold* in ten or twelve cases of constitutional syphilis, and in several instances with complete success. One case of long standing, and extremely severe, which had resisted the repeated employment of mercury and sarsaparilla, was entirely cured by the use of this preparation in union with the extract of cicuta. I have usually commenced with one-tenth of a grain three times daily, and gradually increased it to one-sixth of a grain. It should be given in the form of a pill, and the patient must be directed to avoid taking acids into his stomach. The best mode of using it is in union with the extract of conium or of hyoscyamus. Without the addition of some article of this kind, it often gives rise to very unpleasant sensations in the stomach. For a more particular account of the remedial powers of this article, the reader is referred to my work on the Materia Medica.

The acetate of copper (*verdigris*) has been highly extolled by some German physicians, as a remedy in syphilitic affections. M. Schlegel has published a number of cases illustrative of its good effects in diseases of this kind. He asserts, that by the following combination, he has almost uniformly succeeded in removing even the most inveterate syphilitic affections.† This article was formerly

*℞.—Rad. sarsaparil. ℥ii.
Flor. borag. officin.
Petal. ros. gall.
Fol. sennæ,
Sem. anis., āā ℥ii.
Sacch. communis,
Mel. despumat., āā ℔ii.—Boil in a sufficient quantity of water to extract the virtues of the sarsaparilla. Strain, and add the sugar and honey; then boil it down to the consistence of a syrup. To each pound of the syrup may be added *one* grain of corrosive sublimate. The dose is from one to two ounces twice or thrice daily. This is the *Sirop de Cuissinier*.

℞.—Rad. sarsaparillæ,
Lign. guaiac. offic., āā ℔i.
Fol. senn.
G. Arab., āā ℥i.
Rad. zingiberis ℥ss.
Aq. fontanæ ℔x.—Boil the first two ingredients in water for one hour; strain, and add to the residuum the same quantity of water as before, then boil it for two hours, and towards the end of the boiling add the other ingredients: strain, and to both decoctions add
Sacch. communis,
Mel. opt., āā ℔iii.—Boil the whole to the consistence of a syrup. The dose is ℥ii twice or thrice daily. This is the rob antisyphilitic of Laffecteur.

I have used the following syrup with peculiar advantage:

℞.—Rad. sarsaparillæ ℥iii.
Fol. chimaphyllæ umbel. ℥ii.
Sulphuret. antimonii, enclosed in a linen cloth ℥i.
Aq. bullient. ℔iii.—Boil it down to three half pints; then add—
Mel. despumat. ℥viii.—Dose, a wineglassful four times daily.

† ℞.—Ærugo æris grs. ii.
Solve in aceti concent. ℈ii.
Camphoræ grs. iv.
Opii grs. ii.
Micæ panis, q. s. ut fiant pilul. No. 40.—Take from five to ten three times daily.

much employed in scrofulous and other varieties of ulcerative diseases, and I have myself given small doses of it in affections of this kind with the happiest effect. It may be given in doses of from one-eighth to one-sixth of a grain three times daily; and when united with full doses of the extract of cicuta, it is capable of doing much good in obstinate scrofulous and venereal ulcerations.*

The carbonate of ammonia, too, has had zealous advocates as a remedy in syphilitic affections. In conjunction with full doses of opium, it is capable of procuring much benefit in cases attended with a debilitated and irritable state of the system. In a case I attended about a year ago, twenty grains of the carbonate of ammonia with a grain and a half of opium were given three times daily with the happiest effect. The patient was much debilitated, and in a peculiarly irritable condition, with a large, foul, and sanious ulcer on the sternum. Under the use of this combination the ulcer healed, and the general health of the patient was greatly improved.

For the cure of venereal nodes, when not attended with much febrile irritation, we possess no remedy more frequently successful than *arsenic*. I have repeatedly prescribed from ten to twelve drops of Fowler's solution, twice or thrice in a day, with entire success. This potent article is also a valuable medicine in the arthritic or rheumatic pains which are apt to succeed syphilis and ill managed mercurial courses. From one-tenth to an eighth of a grain of arsenic, with two grains of the extract of aconitum, should be given three times daily. For the same purpose I have also used the sulphate of zinc with excellent effect. Two grains of this article united with half a grain of opium, may be given three times daily. In several very severe and obstinate cases, this combination procured great and permanent relief.

Buboes.

Buboes are often extremely troublesome affections; and in irritable and scorbutic habits, or from an abuse of mercury and improper exposure, often give rise to the most destructive and unmanageable ulcerations. Buboes may arise either from mere sympathetic irritation, or from absorption of the venereal virus. The former variety of buboes is not uncommon in virulent gonorrhœa; and they arise, often, from the superficial ulcerations and patchy excoriations which occur in the internal surface of the prepuce and glans penis. Sympathetic buboes often disappear as soon as the primary local irritation upon which they depend is removed. Sometimes, however, they become indolent, and remain stationary for a long time. In instances of this kind, mercurial frictions, blistering, or simple emollient poultices, will either dispose them to disperse or to proceed to suppuration, after which they readily heal. I have lately used frictions with the *hydriodate ointment*, in a case of indolent sympathetic bubo, with marked benefit.

Professor Alban G. Smith has been in the habit of employing an ointment composed of one ounce of strong mercurial ointment, intimately mixed with two or three drachms of the extract of belladonna. A small portion (about half a drachm) is to be rubbed on the tumor two or three times daily. He assures me that of all the means he has ever employed for the dispersion of buboes and other glandular engorgements, this ointment has most frequently answered his intentions. I have, in several instances of enlargement and induration of the mammæ, used this remedy with the most satisfactory results.

Swediaur divides buboes into the *tonic* and *atonic;* a distinction which is frequently verified in practice. The former are attended with symptoms of active inflammation in the tumor, and with an evident phlogistic state of the general system. The pulse is full, hard, and quick, and the local pain violent and con-

* See Eberle's Mat. Med., vol. i. p. 304, 3d ed.

stant. The *atonic* bubo is accompanied with the reverse conditions—the symptoms indicating general debility.

So long as the inflammation is not very high, or signs of commencing suppuration have not yet made their appearance, efforts should be made to disperse the tumor as speedily as possible. It is a common opinion, that the dispersion of a bubo without bringing it to suppuration, is apt to be followed by dangerous consequences, under the idea that the venereal poison may be retained in the system, and give rise to subsequent unpleasant affections. For this apprehension, however, there is not the least foundation.

Many practitioners are in the habit of depending chiefly on mercurial frictions upon the tumor or on the inner surface of the thighs, for the purpose of discussing buboes; but this practice is very rarely followed with success, unless active antiphlogistic means, both local and general, be employed at the same time. The most efficient means for reducing inflamed buboes, where the general habit is phlogistic, are: local and general bleeding, saline purgatives, nauseating doses of tart. antimony, a very simple and unirritating diet, perfect rest, together with cold astringent lotions—particularly lead-water to the tumor, and mercurial frictions on the inner surface of the thighs. When the general irritation or phlogistic excitement is not considerable, venesection may be dispensed with; but in instances attended with a bright red erysipelatous appearance of the skin over the tumor, in robust and plethoric habits, scarcely anything will avert suppuration, except very efficient general blood-letting. When these measures do not arrest the progress of the bubo, and its tendency to suppuration is uncontrollable, means should be used to promote the suppurative process; and for this purpose, I know of nothing better than emollient poultices.

Professor Dupuytren strongly recommends an ointment, composed of twenty-four parts of strong mercurial ointment mixed with six parts of muriate of ammonia. This is to be applied by frictions over the region of the engorgement. I have used this ointment with much success in indolent buboes, and in glandular indurations about the neck.

In atonic buboes, advancing slowly, and remaining for weeks in nearly a stationary condition, without manifesting a tendency either to suppuration or to resolution, the application of blisters to the tumor will often succeed in dispersing it, or at all events expedite its termination in suppuration. Both Mr. Carmichael and Mr. Bacot recommend blisters as, in general, decidedly the best applications to indolent buboes. The former observes, that, "in such cases, (hard and indolent buboes,) the greatest advantage may be derived from the repeated applications of blisters to the indurated bubo, which soon either causes the dispersion or suppuration of the tumor;" and Mr. Bacot says it is a practice which he has pursued for nearly fifteen years, with the most satisfactory results. (*Loc. cit.*, p. 24.)

When buboes of this kind occur in persons of a languid and feeble state of the body, much benefit will sometimes be derived from a generous diet, and the use of tonics and wine. When we fail to disperse the tumor, and it has been brought to suppurate, the matter should not be suffered to ulcerate an opening through the integuments. A free incision, with a common abscess lancet, should be made into the cavity and the matter evacuated. When the buboes advance to suppuration, while their integuments are firm, and but little discolored, Mr. Bacot advises the passing a small seton through the base of the tumor. Mr. Swediaur and some other writers, however, think it much better to suffer suppurated buboes to open spontaneously by ulceration; for the artificial opening, he says, "is often made too early, before the abscess is fully maturated." This, however, is an argument rather against the improper, than the judicious use of the lancet; for it is not improbable than an incision made before the tumor is fully suppurated, may give rise to unpleasant consequences. It is undoubtedly proper to delay making an incision until the abscess appears to be matured, but

after this has been brought about, it is difficult to conceive any advantage from suffering the matter to remain some days longer confined.

When the abscess is laid open, it will generally heal under the use of gently stimulating ointments and emollient poultices; but in some instances the ulcerative process continues; or the abscess acquires an indolent and unfavorable character, which prevents it from healing. In syphilitic bubo, mercury is indispensable; but where there is a scrofulous or a scorbutic habit, and in instances where the general system is enfeebled and irritable, the worst consequences will sometimes follow the active employment of mercurials. When a bubo assumes a more unfavorable aspect under the use of mercury, it should be immediately discontinued, and opium with sarsaparilla decoction freely used; and in feeble habits, recourse must be had to cinchona, the mineral acids—particularly the nitrous acid and opium—with a generous diet and pure air. When the opened abscess remains stationary, soft, and flabby, discharging a copious thin ichorous fluid, we may inject a weak solution of sulphate of copper, or of the yellow mercurial lotions (corrosive sublimate grs. x, lime water ℥viii) into the cavity, and apply stimulating cataplasms—such as a common poultice with a few drachms of cinchona mixed with it; or pieces of linen moistened with the tincture of galbanum over the sore. The internal use of opium or cicuta in full doses, will also be particularly serviceable in cases of this kind. The regular use of the latter narcotic is especially valuable in cases attended with symptoms of scrofula.

When the bubo opens while a portion of it remains indurated, Mr. Swediaur recommends repeated cathartics, and the application of irritating remedies, such as the mercurial ointment, weak solutions of corrosive sublimate, &c. The solution of sulphate of copper, or the black mercurial wash, will often answer well in such cases.

Sometimes the ulcers formed by suppurated buboes become surrounded with projecting, indolent, and undermined edges; "and if these edges are not removed by art, the ulcer will remain for months, and perhaps years, without healing." In such cases, says Carmichael, "caustic, however powerful, is so slow in its operation upon the extensive and undermined edges of the buboes, that I always make use of the scalpel for their removal: and this treatment has caused many of them to heal in five or six weeks, which would have resisted any other mode of practice as many months. Full courses of mercury always increase their tendency to *burrow*, and to extend their circumference."

In foul and sanious ulcers of this kind, without the elevated and indurated edges just mentioned, much benefit will sometimes result from charcoal or carrot poultices; and where the surface is spongy and indolent, the application of *nitric acid* by strips of linen moistened with it, often produces a very excellent effect.

Minute portions of the muriate of mercury, in conjunction with full doses of the extract of cicuta, very generally contribute materially towards the successful management of ulcerated buboes. When the system is irritable, opium in large doses, or the extract of cicuta, or hyoscyamus, should be regularly given without the mercurial.

Sect. III.—*Amenorrhœa.*

This is one of the most common forms of menstrual disease, which, though sometimes borne without any material inconvenience, seldom fails ultimately to derange the general health, and unless remedied, often leads to the most distressing and dangerous consequences.

The *exciting causes* of amenorrhœa are exceedingly various. Everything which is capable of deranging the general health, has a tendency to excite irregularities or suppression of the catamenial discharge. Organic and inflammatory visceral affections—more especially pulmonary consumption—chronic hepatitis,

and gastro-intestinal phlogosis or irritation, are rarely unaccompanied by menstrual irregularities, and often by a total and obstinate suppression of this evacuation. Mental emotions, particularly protracted grief and despondency, and sudden terror or violent anger, have a powerful tendency to arrest the catamenial discharge. Metastasis of rheumatism—of erysipelas—and of chronic cutaneous affections; habitual hemorrhoidal discharges, as well as other varieties of hemorrhage, leucorrhœa, and deficient and unwholesome nourishment, may also give rise to this affection. But by far the most common cause of amenorrhœa is *cold*, operating on the system either during the interval of the menstrual period, or immediately before the menses are about to appear, or finally during the actual flow of the evacuation.

When the exciting cause acts during the interval of the catamenial periods, the menses will either not make their appearance at the next period, or they will, perhaps, begin to flow sparingly for a few hours, and then cease. In general, no material inconvenience is felt from the absence of the evacuation, and in some instances it returns spontaneously at the succeeding period. Occasionally, however, considerable uneasiness in the pelvic region, pain in the loins, irregular determinations of blood to the head or chest, and in nervous subjects, various hysterical symptoms, are the immediate consequences of the suppression. But although the system frequently bears the suppression of this evacuation without any materially unfavorable consequences during the first six or eight weeks, more or less derangement of the general health invariably ensues, if the menses fail to make their appearance after the second or third period. The usual symptoms which ultimately arise from this affection are: languor and debility; a pale and sickly expression of the countenance; swellings of the ankles; various nervous affections, such as paroxysms of palpitation of the heart, and dyspnœa; flatulent and spasmodic pains in the bowels; loss of appetite; and in relaxed and leucophlegmatic habits, leucorrhœa. In subjects predisposed to phthisis pulmonalis or some other local or general disease, protracted suppression of the catamenial evacuation is always particularly dangerous, from its strong tendency to develop such affections.

When the menses are suddenly suppressed, whilst they are flowing; or when the remote cause of the obstruction is applied immediately before the impending appearance of the evacuation, the consequences are much more violent and sudden. In such cases, the most alarming symptoms sometimes almost immediately follow the suppression of the discharge. In some cases, paroxysms of violent spasmodic pains occur in the bowels and stomach, attended occasionally with severe retching. In other instances, strong determinations of blood take place to the brain, giving rise to raving delirium, hysteric mania, convulsions, or a temporary loss of sensation and voluntary motion. Sometimes extremely alarming palpitations of the heart, with great difficulty of breathing, occur, and in some cases the irritation passes at once upon the sanguineous system, occasioning high febrile reaction, and local inflammatory affections.

Treatment.—When one or more of the violent affections just mentioned succeed the sudden suppression of the menses, the first object must be to allay the alarming and painful symptoms, without any immediate attention to the restoration of the evacuation. The attempt, indeed, to reinstate the catamenial secretion, at the period when it becomes arrested, is almost always abortive; yet the remedies which may be proper to palliate or remove the present symptoms, will occasionally have the effect of bringing back the suppressed evacuation.

In young and plethoric subjects, or where strong determinations of blood take place to the head or lungs, efficient venesection should be promptly resorted to. We can, indeed, seldom allay the violent spasmodic and painful symptoms very materially by this measure alone; but in the habits just mentioned, it constitutes an essential preliminary to the successful employment of other remedies—particularly *opium* and *ether*, which in most instances afford more speedy relief

than any other remedies we possess. Active cathartics and purgative enemata, sinapisms to the inferior extremeties, warm pediluvia, and antispasmodics, are the principal means to be relied on. In weak and nervous females, it will not be necessary, and often improper, to bleed. In cases of this kind, warm pediluvia, with a few full doses of laudanum and camphor, will in general speedily allay the alarming and painful symptoms which often accompany this accident. Dr. Dewees states, that he has found nothing to answer so well, where the pain in the stomach or lower part of the abdomen is severe, "as an injection composed of a gill of thin starch, a teaspoonful of laudanum, and thirty grains of finely powdered camphor; and if it be complicated with hysteria, the addition of three teaspoonfuls of the tincture of assafœtida, instead of the camphor, may be useful." I have in several alarming instances known very complete relief obtained from the injection of laudanum into the bowels; but where the stomach will retain the medicine, it will act more promptly when administered by the mouth. Little or no benefit, however, will result from an ordinary dose of this narcotic in cases of this kind. From two to three grains of opium, with ten or fifteen grains of camphor, should be given at once. It should be particularly recollected that where the tendency to cephalic congestion is strong, or in full, young, and vigorous subjects, an efficient abstraction of blood must be premised to the use of these remedies. In one case of suddenly suppressed menses, attended with wild raving and paroxysms of extreme pain in the stomach, half an ounce of the tincture of secale cornutum completely allayed all the symptoms in less than fifteen minutes.

A vast variety of remedies have been recommended for the purpose of restoring the suppressed catamenial evacuation; but we may safely affirm, that the amount of injury which has been done by the indiscriminate and unseasonable exhibition of medicines of this kind (*emmenagogues*) is incomparably greater than that of all the advantages which have as yet resulted from their employment. I do not wish to be understood as condemning, unqualifiedly, the use of such remedies; for under judicious management, they are not only often decidedly useful, but in some cases, indispensable to success. The practice, however, of resorting to active emmenagogues in the beginning of the treatment, without an especial regard to the general state of the system, and the peculiar circumstances of the case, under an idea that they possess a direct or specific power of restoring this secretion, has been, and no doubt will continue to be, the source of various and irremediable mischief.

Amenorrhœa in young subjects is at first almost invariably accompanied by a manifest phlogistic habit of body. In instances of this kind, moderate abstractions of blood, aided by a simple and unirritating diet, laxatives, and regular exercise in the open air, are all-important remedial measures. Where the disease has developed local inflammations, or sustains irregular determinations to internal organs, especial means should be used, in conjunction with the general remedies just mentioned, to counteract the local affection, before any direct attempt is made to excite the uterine vessels. Blisters, rubefacients, the warm bath, antimonials, &c., may all be beneficially employed under circumstances of this kind.

In France, the application of leeches to the pudendum is a very common practice, and there can be no question as to the propriety and favorable tendency of this practice. M. Chomel recommends the application of four or five leeches daily, for five or six days in succession, at the expected menstrual period. Some days previous to the employment of the leeches, he orders dry cupping on the upper and inner part of the thighs, and warm vapor baths to the lower part of the body.*

When the suppression occurs in relaxed and debilitated females, with a small, feeble, and languid pulse, the first object should be to invigorate the general sys-

* Rev. Med., January 1828.

tem, and to improve the digestive and alvine functions. Iron,* mild tonic bitters, a simple, but nourishing diet, exercise by gestation, and gentle aloetic aperients,† are especially indicated in such cases. I have derived much advantage in amenorrhœa, attended with languor and debility, from the *black sulphuret of iron*, in union with small portions of ipecacuanha. Five grains of the former, with one of the latter, may be given three times daily. It is proper to observe, however, that even in cases attended with much languor and weakness, mild aperients are sometimes important remedies, preliminary to the employment of tonics; for it is not uncommon to find the bowels exceedingly loaded in such cases, and there can be but little advantage derived from invigorating measures, so long as this condition of the intestinal canal continues.

Sometimes cases that come on slowly, and apparently without any direct exciting cause, will be found, on close examination, to be connected with chronic irritation, or phlogosis of the mucous membrane of the bowels, from a remora of fecal matter in the bowels, or from the habitual use of a superabundance of coarse, irritating, or indigestible aliment. I have recently seen a remarkable instance of this kind. The patient, a laboring woman, about twenty-five years of age, had suffered a long time under amenorrhœa, and the usual attending nervous symptoms. When I first saw her, she was debilitated, and considerably emaciated, but stated that her appetite was very craving. As she ascribed all her complaints to the absence of the menstrual discharge, she had taken a great deal of medicine, obtained from one of our public charitable institutions, for the purpose of "bringing on her courses." On examination, I found her abdomen tumid and hard, the tongue like a piece of raw flesh along the edges and point, and the appetite voracious—in short, with all the symptoms of high irritation of the mucous membrane of the stomach and bowels. I ordered her a few doses of castor oil, and put her on the exclusive use of rye-mush aud milk for her diet, with which she faithfully complied. In four weeks the tension and fullness of the abdomen had subsided, and the tongue presented a much better appearance. The diet was continued, with the addition of a little weak animal broth at noon, and I prescribed an emulsion of balsam copaiva, in small doses, to be repeated thrice daily. This she continued for four weeks, at the end of which time she thought herself quite well, although the menses had not yet returned. She was now put on the use of the following pills,‡ which in two weeks restored the long-suppressed catamenia.

By thus pursuing a general treatment adapted to the particular circumstances of the case, we may often restore the menstrual evacuation; and should we even fail in effecting this purpose, we shall, nevertheless, gain some advantage, by placing the system in a condition favorable to the operation of the remedies more directly calculated to act upon the uterine system.§

* ℞.—Ferri phosphat. ʒi.
Pulv. zingiberis ʒii.
—— aloes Soc. grs. v.—M. Divide into ten equal parts. S. Take one twice or thrice daily.—Or,
℞.—Extract. gentian. ʒi.
Sulphas. ferri grs. iv.
G. aloes Soc. grs. v.—M. Divide into twenty pills. S. Take one every morning, noon and evening.

† ℞.—Pulv. rhæi ℈iv.
G. aloes ℈i.
Pulv. capsici ʒi.
Muc. g. Arab. q. s.—M. Divide into twenty pills. Take two at night on going to bed.

‡ ℞.—Sulphat. ferri grs. v.
G. myrrh,
G. aloes, āā grs. x.—M. Divide into twenty pills. S. Take one every morning, noon and evening.

§ These remedies appear to promote the menstrual evacuation, solely by their tendency to determine the blood to the pelvic viscera, or more particularly to the uterus; and it is hence obvious, that where symptoms of high irritation or chronic inflammation of the uterine system

Dr. Dewees speaks in the highest terms of praise of the *tincture of guaiacum* as an emmenagogue. "I have for more than eight-and-thirty years," he says, "almost daily used this medicine in suppressed catamenia; and more especially in those of long standing, *without its having failed in any cases* proper for its use—that is, where the suppression was not the consequence of disease of the uterus or of pregnancy." This is, indeed, great praise; for Dr. Dewees must have treated perhaps several thousand cases of this affection during the long period he mentions. That Dr. Dewees has been eminently successful with the employment of this remedy is unquestionable; yet it may be mentioned as a singular circumstance, that although I have employed it in no small number of cases of this affection, and, as I thought, in a vigorous and persevering manner, I have never known it to procure the least apparent benefit, except in one case only. It must be observed, too, that although the doctor's mode of employing this remedy has been for many years well known to the practitioners of this city, I have, as yet, met with none who has been even moderately successful with it. Dr. Dewees himself notices this fact. "I have learned," he observes, "that some of my brother practitioners have not been equally successful with it—but I think I can readily account for their failure; first, from their not placing the system in a proper situation for its use; and secondly, by not properly persevering in the remedy."

The medicine in which I have hitherto most confided as an emmenagogue, after the system was duly prepared by general treatment, is aloes, in small doses, in combination with the extract of savin and ipecacuanha, according to the following formula.* I have, indeed, often failed with this medicine; but, upon the whole, I have more frequently succeeded with its employment than with any other article or combination. The tincture of melampodium, too, has occasionally succeeded well in my hands; and within the last few years I have employed the spirits of turpentine with success in several cases. Where hysterical symptoms attend, peculiar advantage may sometimes be obtained from the following pills.† The tincture of cantharides, too, has been highly recommended as a remedy in this affection. Dr. Joseph Klapp, of this city, has published an account of his experience with this article, from which it would appear that, under judicious management, it will often operate very beneficially.‡ It should be given in gradually increased doses, beginning with twenty or twenty-five drops three times daily, until a slight degree of strangury is produced, when it must be omitted, and resumed when the urinary affection has subsided. This article is certainly worthy of particular attention as an emmenagogue, after proper evacuations have been made. I have but seldom prescribed it; but in one of the few instances in which I employed it, the menses were very speedily restored after it was carried to the extent of causing slight strangury. This remedy is especially adapted to cases that are attended with leucorrhœa; but in such instances it is particularly important to reduce the local inflammatory action of the vagina, by proper local and general remedies, previous to the employment of the cantharides. There is, indeed, scarcely an end to the number of articles and combinations that have been boasted as remedies for exciting the menstrual secretion; but, so far

are present, all medicines of this kind are highly improper. When, for instance, a puruloid leucorrhœal discharge attends, with other signs of vaginal irritation, purgatives, low diet, rest, emollient injections into the vagina, and, perhaps, local bleeding, are indispensable preliminary measures.

* ℞.—G. aloes Soc. grs. xv.
Extract. sabin. ℈ii.
Pulv. ipecac. ℈i.
Mucilag. g. Arab. q. s.—M. Divide into forty pills. Take two pills three times daily.

† ℞.—G. aloes ʒii.
— assafœtid. ʒii.
— myrrh ʒss.
Sulph. ferri ʒss.—M. Divide into three grain pills. Take two twice daily.

‡ Med. Recorder, vol. i.

as my experience enables me to judge, they are all much more apt to fail than to succeed in restoring the suppressed catamenial function. Dr. Lavagna, within the last five or six years, has published an interesting statement of the good effects of injections of the *aqua ammonia*, diluted with water, into the vagina, as a remedy for the suppression of the menses. Dr. Hosack, also, has reported a case of ten years' duration, which yielded to the employment of the ammonia in this way. Ten or twelve drops of the *aqua ammoniæ puræ*, mixed with an ounce of milk or water, is to be thrown into the vagina, by means of a syringe, four or five times daily. If this does not produce a very perceptible sensation in the part, a few drops more of the ammonia must be added to the subsequent injections; but if the irritation be excessive, the quantity must be diminished. Dr. Hosack diluted a drachm of the ammonia with a pint of rain-water, of which a syringe full was thrown into the vagina three times daily. The cure was accomplished in five weeks.* I have heard of but one instance of the employment of this remedy in this city; and in this case it failed in doing good. The testimony, however, that has been published in its favor is respectable, and well worthy of attention.

Dr. Loudon has published an account of two long-standing cases of amenorrhœa, which yielded to the repeated application of leeches to the mammæ. Two leeches were applied to the lower part of the breast, every other day for one month. About the end of the third week, the breasts swelled enormously, and in five or six days more, the menses began to flow.

Sect. IV.—*Dysmenorrhœa.—Painful and Imperfect Menstruation.*

Dysmenorrhœa is a common, and generally an extremely harassing affection. It may occur at every period during the menstruating stage of life; but it appears to be the most common between the twentieth and thirtieth years of age, and in subjects of an irritable and sanguineous temperament. In many instances, severe pains are experienced in the back, loins, and lower part of the abdomen, for five or six hours previous to the appearance of the menstruous evacuation. This, however, soon ceases, and an immediate aggravation of the torturing pain follows. Sometimes the catamenia begin to flow moderately, with little or no previous pains; but in an hour or two they become suddenly arrested, at the same time that violent pains come on in the hips, hypogastrium, loins, back, and thighs, with a distressing sensation of forcing or bearing down in the pelvis. Occasionally, a very slight menstrual discharge continues uninterruptedly for three or four days, accompanied throughout with extremely severe pains in the pelvis and lower portion of the abdomen; and in some rare instances, the catamenial evacuation, although attended with great suffering, is sufficiently copious and prolonged in its course, and may even exceed the regular duration and quantity of an ordinary healthy menstruation. (Jahn, Burns.) In by far the greater number of cases, however, the evacuation, as has just been stated, begins to flow moderately, and after an hour or two ceases again, under great sufferings. Some patients are much harassed by severe headache or nausea, and paroxysms of violent retching and vomiting, during the first few hours of the complaint.

These pains continue for a period, varying from two or three hours to several days, terminating commonly in the discharge of a pseudo-membranous substance from the vagina similar in appearance to the *decidua*. Females laboring under painful menstruation generally experience two distinct kinds of pain; namely, the intermitting expulsive pains resembling those of labor or abortion; and the constant menstrual pains in the back, pelvis, loins, and thighs, which occur often in regular menstruation, shortly before the appearance of the evacuation.

Dr. Dewees observes that there are two distinct states of this affection, which,

* New York Med. and Phys. Journ.

in a prognostic point of view, are worthy of attention. Thus, in some cases, the mammæ sympathize strongly with the uterus—becoming tumid, and often very painful and tender to the touch; whilst in other cases the breasts remain wholly free from any affections of this kind. The former variety of cases, says Dr. Dewees, are much more manageable than the latter—an observation which I believe to be well founded, however inexplicable it may be.

Some writers seem to think that the formation of a pseudo-membranous substance upon the internal surface of the uterus is always present in this affection, and constitutes, in all instances, the immediate cause of the difficult and painful menstruation. This, however, does not appear to be founded on correct observation. I have known females to suffer very painful and incomplete menstruation for two, three, or four periods in succession, and afterwards menstruate regularly without any particular difficulty, where no membranous matter whatever was at any time discharged. It must, moreover, be observed, that painful menstruation is not universally attended with a scanty flow of the catamenial fluid. I have met with several instances where, in point of quantity and duration, there was nothing irregular in the menstruation, but where, notwithstanding, extreme suffering attended each menstrual period. This, we may reasonably presume, could not take place, if the internal surface of the womb were coated with false membranous matter. It may, indeed, be supposed that the bloody secretion in such cases is furnished by the vessels of the mouth of the womb, or even by those of the vagina; but this assumption is extremely improbable. It cannot be denied, that in very many cases, such membranous concretions are present, and exercise a direct agency in the production of the difficulties which occur in this affection. It is nevertheless certain, that these masses of concreted lymph are themselves the product of a morbid action of the secreting vessels of the uterus; and there can scarcely exist a doubt that this diseased vascular action may of itself produce the difficulty and pain in question, independent of the formation of pseudo-membranous matter.

I cannot accord with Dr. Dewees in his notions concerning the etiology of this affection, or rather "of the membranous productions so often yielded in dysmenorrhœa."

"Before I attempt an explanation of the formation of this membrane," he says, "I must direct the attention to a very remarkable circumstance in the character of the menstrual blood, namely, its not possessing the property of coagulation. From this it appears that the blood, or part of it, has suffered some change by the action of the uterine vessels; and that this change has been imposed upon the coagulating lymph by the process of secretion. Now, it is not difficult to suppose that the uterus, like every other organ, may have its functions impaired; in consequence of which the texture of the coagulating lymph, instead of being subdued, as it is wont to be when the uterine secretory action is perfect, remains nearly the same as when it entered this viscus; except that it may be attenuated, as in some inflammatory diseases; and it will, from this imperfect elaboration, be thrown into the cavity of the uterus, without being dispossessed of the power of separation and of coagulation. It is poured into the uterus in a very gradual manner; and from this circumstance may tarry there sufficiently long to separate into its constituent parts; the colored part, or red globules, from their greater weight, will leave the imperfectly subdued lymph, and fall to the bottom of the uterus, and sooner or later be discharged; while the coagulating lymph, either in part or altogether, will be left to spread itself over the internal surface of the uterus; and there quickly assume, as is usual with it when in contact with living parts, the appearance of a membrane."*

These sentiments appear to me not only contrary to well-established pathological principles, but most unquestionably, also, to the phenomena of dysmenorrhœa. That the menstrual action of the uterus is morbid or deranged is, indeed,

* A Treatise on the Diseases of Females, second edition, p. 91.

sufficiently obvious; but so far from this derangement consisting in an *impaired* or enfeebled action of the uterine vessels, every phenomenon clearly indicates that the vessels of the uterus are in a state of *increased* excitement, amounting, perhaps, in many cases, to a sub-inflammatory action. The sense of fullness, tension, and pain in the pelvis, loins, and back; the accelerated, quick, and tense pulse; the hot and feverish skin, are strong manifestations of inordinate excitement and sanguineous congestion in the uterine system.

Lymph is never thrown out in such a state as to form membranous matter, except from inflamed, or at least highly irritated surfaces. The formation of such concretions is, indeed, one of the most certain evidences of previous inflammatory action in a part. Most assuredly Dr. Dewees will not contend that the *decidua*, which strongly resembles the membranous masses thrown off in dysmenorrhœa, is formed by an impaired action of the uterine vessels, and in the manner stated in the above quotation. It may be observed, too, that if incrustations of lymph arise from the gradual separation of blood retaining its coagulability, in consequence of impaired or deficient action of the uterine vessels, we should, no doubt, frequently meet with these pseudo-membranous formations in the slow and protracted uterine menorrhagiæ which are apt to occur about the period of the final cessation of the menses—but which, so far as I know, has never been observed. From an attentive estimate of the phenomena of this affection, as well as from analogy and certain established principles in pathology, we may, I think, conclude, that in dysmenorrhœa generally, whether attended with the formation of membranous structures, or devoid of such concretions, the uterus is in a state of much sanguineous congestion, attended with an irritable and highly irritated condition of its vessels. The discharge at first flows moderately for a short time; but the action of the vessels appears soon to transcend the grade of menstrual secretion, and, instead of the catamenial fluid, lymph is often secreted by the irritated vessels, which concretes on the internal surface into the form of a membranous substance. This opinion of the pathology of dysmenorrhœa is much strengthened by the fact, that all medicines that have a tendency to *excite* the uterine vessels, as the usual emmenagogues, are uniformly pernicious. Would this be the case if the disease were the result of an *impaired* action of these vessels?

From much close attention to this disease, for the last six or seven years, I have been led to believe that it is very frequently dependent on a *rheumatic affection of the uterus*. In a case which I attended some time ago, the connection of rheumatism and this affection was strikingly illustrated. The patient, of an irritable and sanguineous habit, was very subject to rheumatic pains in the left, and sometimes in the right ankle joint, which often continued for several weeks. For more than five years, she observed that whenever she felt the pain in the joint at the menstrual periods, she menstruated with little or no difficulty; but when the period returned while the ankle was free from pain, she invariably suffered excruciatingly during the very sparing and transient flow of the menses.

Dr. Mackintosh thinks, that in no inconsiderable number of instances, dysmenorrhœa depends on a nearly impervious state of the os uteri. He states, that he has in his museum many preparations of the uterus, which were taken from females who had died of different diseases, particularly phthisis, "and whose histories proved that they had labored under dysmenorrhœa from the very beginning of their menstrual lives." In these preparations, the orifices of the womb are, many of them, so small "as to be just capable of receiving a bristle; others allow a common sized silver probe to enter, and a few are a little larger still." We can readily conceive that such a condition of the mouth of the uterus would be apt to give rise to the symptoms of dysmenorrhœa. The menstrual discharge not finding a ready exit, must cause more or less distension of the uterus, and thereby excite contractions, and painful bearing-down sensations in the womb. "The continuance and frequent recurrence of this uterine irritation will sooner or

later give rise to inflammation in the lining membrane of the uterus, which will account for the formation of the decidua," which is, in many instances, discharged. Impressed with these opinions, Dr. M. resolved to attempt the cure of this affection by mechanical dilatation of the orifice of the womb, as soon as he should meet with a patient who would submit to the operation. "I could not," he says, "propose such a measure to a modest woman, without being able to give an assurance almost amounting to a certainty that it would cure her." Chance, however, threw a suitable case in his way; this was a young woman, who, at each menstrual period, suffered very severe pains, &c., in the back and region of the womb, with scarcely any perceptible catamenial discharge. The uterus was much lower down than natural; no orifice could be felt, but only a small dimple where the opening ought to have been. He could not introduce even the smallest silver probe. An artificial opening was made; and some time after he commenced dilating this orifice, by daily increasing the size of the instrument. On the next menstrual period she menstruated regularly, and has done so since, without pain or difficulty. "I have since," says Dr. M., "dilated *os uteri* in *six* cases of dysmenorrhœa, and I may mention generally, that the success of the practice has been most satisfactory."

Treatment.—The treatment of dysmenorrhœa is divided into *palliative* and *radical;* the former to allay the extreme suffering during the presence of the affection; and the latter to prevent its recurrence, by means employed during the intervals of the attacks.

I have already observed, that all emmenagogue remedies, or such as are calculated to determine the circulation of the pelvic organs, are always highly improper. Dr. Dewees considers *camphor* in large doses as decidedly the best palliative remedy we possess in this painful affection. He recommends the administration of ten grains of this article every hour, until the pains are in great degree allayed; and when the stomach will not bear it, he advises its use in the form of an enema. I have used this remedy with much benefit in some cases; but I have almost invariably prescribed it in union with Dover's powder, in the proportion of six or eight grains of the former to four grains of the latter, every hour. If we can early induce a general perspiration, the painful symptoms almost always speedily decline. To promote this intention, it will be proper to confine the patient to bed, and to direct the use of warm, diaphoretic diluents—particularly elder blossom or eupatorium perfoliatum tea. *Opium*, given in full doses, with small portions of ipecacuanha, so as to excite nausea, but not vomiting, is, perhaps, upon the whole, the best palliative, where the patient is capable of taking this narcotic without the disagreeable effects which, in some habits, it is apt to produce. It may be advantageously given in combination with camphor, in the proportion of a grain of the former to eight of the latter, every hour, until the symptoms are mitigated. Dr. Dewees mentions a case which was cured by the use of *secale cornutum;* but this case does not appear to me to merit the title of *dysmenorrhœa.* It would seem to have been an instance of menorrhagia, accompanied by frequent severe pains, occasioned by the contractions of the womb to expel the coagula. The *warm bath* will occasionally afford considerable relief in dysmenorrhœa, more especially when it is used in conjunction with camphor or opium. *Bleeding* is often decidedly indicated, and although it does not appear to be capable of exerting any direct influence over the symptoms, it is an important auxiliary, or preliminary measure, where the pulse indicates its use, to the employment of the means already mentioned.

In instituting a course of treatment for the radical cure of dysmenorrhœa, particular attention must, in the first place, be paid to the general state of the system. In plethoric and phlogistic habits, a mild vegetable diet must be enjoined, and it is especially important to attend to the state of the digestive and internal functions. When there are signs of a loaded and torpid state of the bowels, it will be highly important to adopt a course of mild aperient treatment, before recourse is had to remedies more immediately directed to the uterine system. An occasional dose

of blue pill in the evening, with a gentle purgative on the following morning, should be used, until the bowels are put in a healthy condition. Jahn asserts, that the occasional employment of an ipecacuanha emetic will sometimes afford very considerable advantage in this affection. When the diathesis is manifestly phlogistic, and the pulse tense or active during the intervals of the attacks, small abstractions of blood, and even antimonials in conjunction with a vegetable diet and aperients, are obviously proper. When the disease is accompanied with a rheumatic or arthritic diathesis, the warm bath, gentle diaphoretics, particularly decoctions of lignum guaiacum, and small doses of the flowers of sulphur, will often be found especially useful.

Among the various remedies that have been recommended as particularly calculated to prevent the recurrence of the affection, the *tincture of guaiacum* is at present most particularly relied on by the practitioners of this city. Dr. Dewees, who introduced this article to the notice of the profession as a remedy in dysmenorrhœa, regards it as incomparably the most efficient means we possess for counteracting this affection. It should be given in as large doses as the stomach will bear, and its use persisted in for three or four months, and even longer, if its good effects are not previously obtained. Dr. D. observes that it is not uncommon to find the first return of the menstrual period, after commencing the use of this remedy, attended with unusually severe symptoms; and he considers this as a favorable symptom. I have employed it occasionally, but with very indifferent success. The remedy with which I have most frequently succeeded in effecting a cure, is the *extract of stramonium*. It is now about six years since I first resorted to this article for the cure of this affection, and I have on record a considerable number of cases that yielded to its powers. My mode of employing it is to give the one-eighth of a grain of the extract (Clutterbuck's preparation) three times daily, commencing about four days before the expected return of the attack. I am persuaded, from what I have witnessed of its powers in this way, that we possess no other article which can at all be compared to it as a remedy in this affection. Immediately previous to commencing its use, the bowels should be freely opened by a purgative, and the patient ought to abstain from all kinds of stimulating food and drink.

The decoction of *polygala senega* has been recommended as a means for curing this affection. Dr. Chapman has expressed his confidence in its powers; but it does not appear that his experience on this head has been sufficiently confirmed by others, to have gained it any reputation in this respect. Formerly I employed it freely in five or six cases, but in no instance with success.

I have known an instance where a salivation, accidentally caused by a mercurial purge, removed the complaint effectually. What would the tincture of colchicum do in cases of this kind? If my notions concerning the rheumatic nature of this affection be correct, it would seem reasonable to expect advantage from this remedy.

Sect. V.—*Leucorrhœa—Fluor Albus.*

This affection consists in a morbid secretion and discharge of a mucous, or muco-purulent fluid, from the vagina; and is, perhaps, the most common disease to which females are subject. It may occur at every period of life, from infancy to old age, but its appearance between puberty and the final cessation of the menses is by far the most common.

The *causes* of leucorrhœa are very various. In general, whatever is capable of relaxing the system, as a luxurious, indolent, and sedentary manner of living; habitual exposure to a humid atmosphere; and want of pure air and wholesome nourishment, are especially calculated to predispose to the occurence of this disease. Females of a relaxed, leucophlegmatic, and nervous habit of body are particularly liable to leucorrhœal discharges, whereas those of a rigid fibre and a

robust, muscular structure, are, comparatively, rarely affected with this disease. Everything which is capable of causing irritation in the mucous membrane of the vagina, and of establishing a preternatural determination of blood to the genital organs, may excite leucorrhœa. But the tendency of causes of this kind to give rise to the disease, depends nevertheless, in a great degree, on the previous constitutional predisposition to this affection; for in many healthy, robust, and active females, scarcely any vaginal irritation, from accidental causes, will produce more than a temporary increase of the mucous secretion. In individuals, on the contrary, of an opposite habit of body—particularly when favored by luxurious living and indolence, the slightest additional irritation of the mucous membrane of the vagina will be apt to excite a more or less permanent morbid secretion from this membrane. The following are the most common and powerful *exciting causes* of this disease. 1. *Excessive venereal indulgence.* Prostitutes, even though previously unaffected with gonorrhœa, are rarely free from morbid vaginal secretions of a leucorrhœal character. 2. *Difficult parturition*, or the irritation caused by the employment of obstetrical instruments. 3. *Frequent and profuse menorrhagia* is frequently followed by leucorrhœa, being usually sustained by the same causes or circumstances that gave rise to the hemorrhagic discharge. 4. *Prolapsus uteri* is almost invariably attended with more or less leucorrhœal discharge, in consequence of the continued vaginal irritation by the dislocated uterus. 5. *Ascarides*, by keeping up a constant irritation in the rectum and neighboring parts, or *by passing into the vagina*, are no unfrequent exciting cause of leucorrhœa in young girls and children. 6. The *abuse of emmenagogues*, particularly when unseasonably employed for bringing on what is often injuriously supposed and treated as tardy menstruation about the age of puberty, often gives rise to obstinate leucorrhœa. 7. A *loaded and torpid state of the bowels*, is a common cause of this complaint in young females. 8. *Tight lacing or dressing about the waist*, by pressing the viscera down upon the uterus, and causing prolapsus, or a descent of this organ from its natural position into the vagina, as well as by impeding the free circulation of the blood in the portal vessels, is a fertile source of leucorrhœa among young and fashionable females. I will venture to say, that of late years, since the preposterous custom of pressing the waist into as narrow a space as cords and steel springs can bring it, has been so general, there are more instances of prolapsus and leucorrhœa among young females than at any other former period, when the abdomen was a little better accommodated with room. 9. The *depressing mental emotions*, by debilitating the general system, and favoring a sluggish circulation in the portal system of vessels, may give rise to the disease. 10. *Metastasis of rheumatism*, &c. is, I conceive, much more frequently concerned in the production of this affection than is generally supposed. It is by no means uncommon to find females, affected with leucorrhœa, to complain of more or less pain in the joints, and I have satisfied myself that the vaginal disease is not unfrequently a purely rheumatic affection. 11. *Self-pollution* is by many of the German writers regarded as one of the most frequent sources of this disagreeable affection in young females. 12. *Atmospheric influences*, particularly vicissitudes of temperature and a warm and *humid* atmosphere. It is said that in Holland, where the air is always loaded with much moisture, leucorrhœa is a very common affection. 13. *Suppressed hemorrhoids;* diseases of the uterus; tumors pressing upon the vagina; mechanical injuries; the intemperate use of spirituous liquors, &c., may all give rise to the disease.

Some females are invariably affected with more or less profuse leucorrhœal discharge for five or six days immediately after the completion of each menstrual evacuation; and others experience the disease only some days previous to each appearance of the menses, remaining in a great measure, or wholly free from it during the remainder of the menstrual intervals.

Symptoms.—In some instances, the discharge has the appearance of the common vaginal mucus. In others it is white, resembling pulverized starch mixed

with a mucilaginous fluid. Sometimes it presents the appearance of pus, possessing an acrid and corroding quality. These differences in the appearance of the discharge indicate the relative degrees of violence of the affection.

In point of quantity, also, great diversity occurs in different cases. In some instances it is so moderate as hardly to occasion any inconvenience, whilst in other cases the evacuation is extremely copious. When the discharge is very profuse, and of an acrid quality, the external parts of the genital organs become red, swollen, and painful, and this state of irritation usually extends into the vagina and even to the mouth of the uterus, rendering the whole passage, and especially the os tincæ, very tender to the touch.

When the disease is suffered to continue, it seldom fails at last to make an injurious impression upon the whole system. The countenance at length becomes pallid and sickly; the eyes dull, languid, and surrounded by a bluish or lead-colored circle; the eyelids tumid; the mind dejected, discontented, and fretful; the whole system debilitated and sluggish; the extremities cold; the pulse small and feeble, or small, frequent, and somewhat corded; the digestive functions deranged, attended with acrid eructations, gastralgia, pains in the back, loins and lower extremities; colic pains in the lower part of the abdomen, constipation or diarrhœa, and pain in voiding the urine.

By degrees the discharge usually becomes more and more copious and purulent; the relaxation and languor of the muscular system increase, whilst the pulse becomes more frequent and irritated. At length, in aggravated cases, the slightest bodily exertions give rise to hurried respiration and palpitation of the heart; and in instances of great severity, the powers of digestion at last become exceedingly weak; nausea and vomiting frequently come on, and finally hectic and rapid emaciations arise. Fortunately, however, cases of this violent character are by no means common; the great majority of instances being much less severe, though sufficiently annoying and debilitating to become a source of much uneasiness and anxiety.

Women who are habitually affected with leucorrhœa, very rarely become pregnant; and where the leucorrhœal discharge is profuse, it may be doubted whether conception can at all take place. In most instances of severe leucorrhœa, the menses are entirely suppressed; and in all cases they are more or less irregular, both in time and quantity. Sometimes they occur at irregular intervals in the form of menorrhagia, but more frequently they appear very sparingly for a day or two, succeeded by an increased flow of the leucorrhœal discharge.

Much discussion has taken place on the question, whether leucorrhœa is a disease of relaxation or debility, or connected essentially with an irritated or inflammatory excitement in the affected parts. It appears to me, however, that it cannot be properly said to be either a disease of debility and relaxation, or one of irritation or sub-inflammation, in an exclusive sense. That the mucous membrane of the vagina and mouth of the uterus is in a state of irritation and even sub-inflammation in this affection, is, indeed, not to be questioned; but it must be recollected that irritation or inflammation is by no means incompatible with debility in the same structure. And let it be borne in mind too, that all the efficient remedies for arresting the discharge are such as are directly calculated to increase the tone of the vessels which give rise to the morbid secretion. Cantharides and astringent injections are the means most generally relied on in this city, for the cure of this affection. Without doubt, inflammation of an active kind is often developed in the course of the malady, and requires reduction before the tonic or stimulant remedies, just mentioned, can be used with propriety; but that such inflammation is merely accidental, and by no means essential to the disease, is manifest from the continuance of the discharge after every symptom of an active inflammatory character has been subdued. In relation to the general system, at least, the terms *debility* and *relaxation* may most assuredly be correctly applied to this disease in a great majority of cases. The languor, general weakness, and relaxation, as well as the feeble and sluggish pulse, so fre-

quently noticed in profuse leucorrhœa, are sufficient evidence of the correctness of this observation.

I am by no means disposed to advocate the old doctrine, that the discharge is owing to a mere relaxation or passive state of the vessels from which it occurs. The increased flow of mucus is unquestionably the result of a morbid *action* of these vessels; and the immediate cause of this morbid action consists in that peculiar deranged condition of the vital properties, designated by the term *irritation*. Nevertheless, this irritation does not imply an *increased power* of action; on the contrary, it is very evident, that the vital energies or powers of action of the irritated vessels are, in the instance in question, decidedly impaired. In most cases, the mucous membrane of the vagina is, in the commencement of the disease, merely in a state of irritation. In its progress, however, chronic inflammation is apt to occur from the constant action of the acrid secretions, or from the accidental supervention of new exciting causes, both of a general and local character.

Treatment.—The cure of leucorrhœa is almost always attended with great difficulty; and protracted and severe cases often continue, in spite of the most judicious and persevering course of remedial management. Although, properly speaking, a local disease, leucorrhœa seldom fails ultimately to derange other organs, and to establish by degrees a general state of ill health. This, however, occurs only in protracted and severe cases, or in very delicate and irritable habits. In some instances the general health is impaired before the leucorrhœal discharge commences. Whether primary or consequent, however, the general state of health ought always to be especially attended to, as an important preliminary step in the remedial management of this affection. General or constitutional indisposition is always a most serious obstacle to the restoration of particular functions, or the cure of local maladies. In the treatment of the present disease, this circumstance must be especially attended to.

When the pulse is active, and the general habit phlogistic, it will be proper to commence the treatment with antiphlogistic measures; and bleeding, simple and unirritating diet, purgatives and antimonials, should be resorted to in cases of this kind. It will rarely be necessary, however, to practice more than one or two moderate blood-lettings, even under the most obvious indications of its usefulness. Purgatives and low diet will, in general, be quite adequate to reduce the phlogistic irritation of the system. In cases attended with indications of a loaded state of the bowels, repeated purgatives are especially demanded; and we frequently find obvious signs of functional disorder of the liver, in severe and prolonged instances of the disease, requiring a cautious employment of alterative doses of blue pill and laxatives.

In prescribing more directly for the removal of the disease, particular attention must be paid to the actual condition of the mucous membrane of the vagina, as it is indicated by the appearances of the leucorrhœal discharge.

When the discharge consists of a thick, transparent, ropy mucus, the vaginal mucous tissue is at the lowest grade of leucorrhœal irritation. The pulse, in this grade of the disease, rarely indicates the necessity of blood-letting, unless accidental causes have increased the momentum of the circulation. In all instances, however, whether the circulation be active or languid, it will be proper in the commencement to evacuate the bowels by one or two purgatives. Where the bowels are tumid, hard, and torpid, which is not unfrequently the case in instances manifestly of general languor and sluggishness of the system, laxatives should be repeated until the bowels are brought to a natural condition.

When the leucorrhœal discharge is white and opaque, or purulent, the local applications must, in the first place, be such as are calculated to moderate the vaginal irritation. For this purpose, it will be useful to direct the patient to inject warm water into the vagina three or four times daily, until the tenderness and irritation of the parts are in a great degree removed; and we may in general derive considerable advantage in this respect, from the injection of a weak solu-

tion of sugar of lead after each injection of warm water. By pursuing this management, in conjunction with a simple vegetable diet, laxatives, rest, and, if indicated, blood-letting, the local and general irritation will usually yield sufficiently, in six or seven days, to enable us to resort with propriety to the means more directly calculated to remove the irritation upon which the morbid discharge depends.

Before I proceed to mention the efficient remedies of this kind, it is proper to observe, that especial regard should be had, both in the preparatory and final management of the disease, not only to the actual grade of vaginal irritation, but also to the *exciting causes* of the malady. To this latter object, I am inclined to think, there is seldom sufficient attention paid; and yet, it must be obvious, much, and in many instances, almost everything, depends on the adaptation of the remedies to the peculiar circumstances which gave rise to, and perhaps, still sustain the disease.

Among the internal remedies generally most relied on, for the cure of leucorrhœa, the *tincture of cantharides* holds the first rank. This article was, I believe, first recommended as a remedy in this disease by the late Dr. Robertson, of Edinburgh; and in this country, Dr. Dewees has for many years employed it with much success. When properly and perseveringly used, after suitable preparatory measures, it will not unfrequently completely remove the disease. I cannot, indeed, assert, that I have been often successful with its employment; but in a few very severe and protracted cases, I have used it with entire success. It may be commenced with, in doses of from twenty to thirty drops three times daily, and gradually increase until it causes a slight degree of strangury. When this symptom occurs, it must be omitted until the *ardor urinæ* disappears, when it should be resumed; but in smaller doses than those which were last given, and again increased until the neck of the bladder becomes affected. In some instances it will be necessary to continue its employment in this manner, omitting and resuming it according to its effects on the urinary passages, for three, four, or even six months, before the disease will be permanently subdued.

The *balsam copaiva* also is a valuable remedy in this affection. I have more frequently succeeded with the use of this article than with cantharides; but to most patients it is an exceedingly offensive medicine, and in many instances its effects on the stomach are such, as to render its use wholly inadmissible. To procure any material advantage from it, it should be given in large doses, and continued for three or four weeks. Where it can be thus freely administered, it will rarely fail to make a very decided impression on the disease, and in conjunction with proper local means, often put a permanent stop to the discharge. From forty to sixty drops should be given three times daily, and when the stomach will bear it, the dose may be increased considerably beyond this quantity. I have always found it most conveniently and readily taken in a portion of warm milk; or we may give it, rubbed up with gum Arabic, white sugar and water, in the form of an emulsion. When it acts too freely on the bowels, a few drops of laudanum should be added to each dose. The *tincture of cubebs* has likewise been recommended in this affection; but it is in all respects much inferior to the balsam copaiva. In cases entirely free from inflammatory irritation in the affected parts, and where the general habit is not phlogistic, the *spirits of turpentine* may be used with material advantage in some instances. I have lately succeeded in curing a case of this kind with the use of this remedy and astringent injections; but in the majority of instances, it is much too irritating to admit of being employed with propriety.

When the general habit is languid and relaxed, some advantage may occasionally be obtained from the internal use of tonic and astringent remedies. The infusion or extract of the root of *rhatany*, has been particularly recommended by some European writers; and in a few instances in which I prescribed it, considerable benefit appeared to result from its use. Dr. Dewees states, that he

has "effected cures in some obstinate cases by the use of alum and nitre—five grains of alum and ten of nitre given three times daily." I have for eighteen years past been in the habit of prescribing alum in combination with ipecacuanha in this disease, and have often known it to produce the happiest effect. I usually administer it in doses of ten grains, with four grains of ipecacuanha—at first twice, and after six or seven days three times daily. This will, in most instances, excite considerable nausea, and occasionally vomiting; but after a few days of employment it ceases to produce this effect; and it has even appeared to me that the emesis which it usually excites, enhances its beneficial operation.

As soon as the discharge becomes thin and more abundant, and the local inflammatory excitement has been moderated by the general measures already indicated, recourse should be had to astringent injections, in conjunction with the use of the tincture of *cantharides*, or the terebinthinate remedies, or alum powders just mentioned. The *sulphate of zinc* forms an excellent astringent injection in most instances of the disease. At first a drachm to a quart of water will be sufficiently strong to inject with; but its strength should afterwards be gradually increased to two, three, or even four drachms, with the same proportion of water. The sulphate of copper also may be very advantageously used for this purpose. Twenty-five or thirty grains to eight ounces of water, will form an injection of proper strength. I have occasionally found a solution of alum, in a decoction of oak bark, as recommended by some of the older writers on this subject, to procure more benefit than any other injection. A drachm to a pint of water may be used for this purpose. Various other injections have been recommended—such as a strong decoction of oak bark; pulverized kino, mixed with water; decoction of nut-galls, &c. I have, of late years, repeatedly used the diluted *sulphuric acid;* and in most cases with decided benefit. Three drops of the oil of vitriol to an ounce of water will, in general, be sufficiently strong; if it produces no sensation of warmth, or slight uneasiness in the vagina, its strength should be increased. Dr. Jewel places great reliance on the use of the nitrate of silver in this affection. He is of opinion that a very common cause of leucorrhœa is a subacute or chronic inflammation of the cervix uteri; and he asserts that we have no remedy equal to the nitrate of silver in subduing this inflammation and its consequences. His mode of employing the nitrate of silver, is either to conceal the caustic in a silver tube, and apply it to the mouth of the uterus, or to apply a solution in the proportion of three grains to an ounce of water, by means of a bit of sponge tied neatly and firmly to a piece of whalebone. In some cases which he reports he applied the nitrate in the form of injection. For this purpose he used at first twelve grains of this substance to six ounces of water. Dr. Marshall Hall observes that the best mode of employing astringent applications to the vagina in this disease, "is to direct the patient to make a scroll of linen of a form and bulk nearly sufficient to fill the vagina:" this scroll is then fully imbued with a strong solution of the sulphate of zinc, and inserted into the vagina after washing it out with cold water. This tampon or scroll may be renewed every three hours.* Some advantage may occasionally be derived from the application of a blister over the sacrum.

In leucorrhœa depending on prolapsus of the uterus, no treatment can succeed in arresting the discharge until the womb is replaced to its proper position; and this can be done only by the use of a *pessary*. It is to be particularly noted, however, that the introduction of a pessary is altogether out of the question, until the irritation and tenderness of the vagina and womb have been subdued by the local and general antiphlogistic means mentioned above.†

* An Essay on Disorders of the Digestive Organs, &c. &c., p. 169.

† [During the last five or six years, pessaries have been almost laid aside by the practitioners of this city, and there has been substituted for them either some species of abdominal truss, under the name of "utero-abdominal supporter," or a modification of the Russian belt, manufactured by Mrs. Betts and several of her imitators.—Mc.]

When the disease is attended with a rheumatic diathesis, or with rheumatic affections, the tincture of guaiacum, and probably colchicum, may be very appropriately employed. Richter recommends camphor and hyoscyamus where the disease has supervened on the disappearance of a chronic cutaneous disease, or some habitual serous evacuation. *Iodine* also has lately been recommended as a useful remedy in this affection. I have prescribed it in two cases, and its use was persisted in for six weeks, without, however, doing any perceptible good.

APPENDIX.

CHOLERA ASPHYXIA.—SPASMODIC CHOLERA.

Cholera asphyxia made its first appearance in August, 1817, at Jessore, a town about sixty miles distant from Calcutta, in Hindostan. Thence it extended its ravages along the principal rivers and great roads, with a pretty uniform progress, until it had crossed the Indian peninsula, and broke out at Bombay, about one year after its commencement at Jessore. Having reached this point, the disease appeared, for a few years, to have attained the utmost western limit of its sway. In June, 1821, however, it made its appearance at Muscat, in Arabia, and advancing in a northwestern direction through Persia, it reached Astracan, at the mouth of the Volga, in September 1823, and, nearly at the same time, broke out at Tripoli, on the eastern coast of the Mediterranean. In 1830, it again made its appearance at Astracan; and thence extending itself rapidly throughout Russia, Poland and Germany, it reached the eastern coast of the Baltic in the summer of 1831. Soon afterwards, the disease appeared in Sunderland, in England; and in the following spring it commenced its ravages in our own country.

Symptoms.—In many instances the approach of this disease is attended with giddiness, a slight degree of languor, and mental depression—a feeling of uneasiness and distension in the abdomen, and almost constant churning noise of flatus in the bowels. Slight cramps, affecting the fingers and toes, particularly during the night, frequently occur—and many complain of a peculiar numbness, and feeling of inability to move the limbs. These symptoms are generally followed by moderate diarrhœa, the discharges being usually natural, and seldom attended with much griping. The duration of this stage is very various.* In some instances, the diarrhœa continues for several days, before the characteristic symptoms of the disease supervene; in other cases, its duration is but a few hours; and, occasionally, the first intimation of the attack is a sudden extremely copious evacuation, the patient feeling as if the whole contents of the intestines were passing off at once. Sometimes, although seldom, the disease commences by nausea and vomiting alone, without any diarrhœa.

The first alarming symptoms are commonly a sudden feeling of faintness, gid-

* [This, which was called the *premonitory stage* of cholera, affected the majority of our citizens during the prevalence of the epidemic in 1832; and was easily cured by the management recommended by our author. In several instances, however, I witnessed sudden attacks of the severe form of the disease without any premonitory symptoms whatever. The gallant Col. Swift was seized in this manner after his prodigious and philanthropic exertions in relieving the sufferers in the Arch Street Prison. His symptoms have been exactly described by Eugene Sue, in his delineation of Rodin's case in the 11th No of the Wandering Jew. Large doses of morphium and camphor, followed by calomel and external stimulation, speedily relieved him from the most alarming condition, and he lives to deserve the gratitude of his fellow-citizens. —Mc.]

diness, ringing in the ears, dimness of sight, uneasiness "amounting sometimes to great anxiety, or feelings of horror." The bowels begin to rumble; a burning pain is usually felt at the pit of the stomach, and violent purging and vomiting ensue, followed by a feeling of great prostration. "If the attack occurs in the day, the patient sits down affrighted at his own situation, or if in bed, awakes, and lies for a moment astonished at the novelty of his feelings: there is a new influence that appears to pervade the whole body, a sensation as if of fluttering on the pit of his stomach, and as a sense of weight or constriction round the waist. This is followed by a prickling sensation in the arms and legs, extending sometimes to the fingers and toes; the hands and feet become cold, and bedewed with a copious clammy moisture; the pulse is usually oppressed and slow, sometimes quick and weak; and there is often pain in the forehead."* When, in this state, the patient raises himself in bed, or attempts to move, he immediately either feels sick, or is purged. The appearance of the fluid discharged by the stomach and bowels resembles that of barley-water, or of a solution of soap in hard water, "consisting of a clear fluid, with more or less of a white flocculent matter floating in it. After the first choleric evacuation, cramps usually supervene. The flexors of the fingers and toes are first affected with spasm; the gastrocnemii and muscles of the thighs are next attacked; and in some cases, the whole muscular covering of the abdomen and trunk is affected. The face soon acquires a deadly pale hue, attended with an expression of great anxiety and distress. The pain or burning sensation in the epigastrium increases, the hands exhibit a shrunken appearance, as if they had been long immersed in water; the skin, generally, is cold, damp and sodden, and the eyes are sunk, and surrounded by a dark ring. At this period of the disease, there is often much restlessness and jactitation; in some instances, however, the patient lies quiet, and desires not to be disturbed. The whole surface of the body has, by this time, acquired a marble-like coldness, and a more or less livid or bluish hue. This lividity of the skin is particularly conspicuous on the hands, feet, face and chest. The breath and tongue, also, are cold, and the whole surface is covered with a profuse, clammy sweat. The thirst is, generally, extremely urgent; the pulse at the wrist and arms is imperceptible, and the respiration is commonly slow, somewhat oppressed, and irregular. In old persons, a peculiar fetor usually emanates from the body. During the whole course of the disease, the secretion of urine, and of bile, of tears and of saliva is wholly suppressed. Notwithstanding the extreme coldness of the surface, there is often so great a sensibility to the impression of heat, that the application of external warmth gives great annoyance to the patient. Although the circulatory and secretory functions are almost wholly suspended, yet the sensorial powers continue unaffected, nearly, if not entirely, to the last. The patient is sensible of all that passes around him; he answers with distinctness and accuracy any question that may be put to him, though it may be in monosyllables only; while his hands are cold and bloodless, he yet retains the sense of touch, and even feels with increased sensibility, sometimes complaining of a painful impression of heat from the application of bodies of moderate temperature. He also, occasionally, retains considerable muscular strength; and the respiration sometimes goes on with ease and regularity, till within a few minutes of death. The whole exhibits an impressive picture of the death of one set of organs, while life still maintains its seat in others."†

The preceding symptoms belong to what is, with propriety, called the second stage of the disease. When this (the cold or blue) stage does not prove fatal, it is invariably followed by more or less of arterial reaction, constituting the third stage of the malady. The liver and kidneys now resume their functions, though,

* Observations on the Pestilential Cholera, as it appeared at Sunderland, &c. By W. Ainsworth, Esq, p. 53.

† Cholera, as it has recently appeared in the Towns of Newcastle, &c. By T. M. Greenhow —page 4.

doubtless, in a morbid or imperfect manner. When the febrile reaction is moderate, the patient usually soon convalesces. More frequently, however, delirium and coma speedily ensue, and the patient dies in a state of apoplectic stupor. Sometimes local visceral inflammations are developed with the arterial reaction; and according to the observation of some writers on this subject, the stage of reaction occasionally assumes the character of a malignant fever, of a congestive or typhoid form, in which "the tongue becomes more loaded, is redder at the tip and edges, and dryer; there is headache; the urine is highly colored; there is soreness upon pressure on the liver, stomach, and belly; the eyes are suffused and drowsy; the gums and lips are covered with a black sordes; the patient is pale, squalid, and powerless; the pulse low and languid; and these symptoms are commonly terminated in delirium and death." (Ainsworth.)

The second or cold stage sometimes terminates in coma, with no other manifestations of increased arterial action than a slight throbbing of the carotids, and warmth of the chest. From this comatose stupor the patient can at first, generally, be roused for a moment; but in a short time the coma becomes perfect, and death ensues, in perhaps a few hours. Occasionally the comatose state is preceded by sudden furious delirium; the patient raves wildly, "but the struggle is usually short, and soon subsides into total insensibility." (Haslewood.)

The preceding description may serve to give a general view of the course and phenomena of this frightful malady; but it is proper to observe, that in relation to the violence or frequency of the purging and vomiting, great diversity occurs in different cases. In some instances, not more than two or three alvine evacuations take place; and cases have been witnessed in which no discharge whatever occurred from the bowels. I have myself seen a case, in which but a single alvine choleric discharge took place, although the patient speedily sunk into a fatal collapse. The evacuations sometimes occur without effort or uneasiness; at others they are thrown out with great force. Although the calls are often very sudden and irresistible, the evacuations are very seldom attended with griping or tenesmus. In the advanced stages of the disease the purging usually ceases, "but in some cases a watery fluid issues from the rectum whenever the patient moves his body, or changes his position."

In some cases the vomiting is frequent and vehement; in other instances it occurs but seldom, and occasionally this evacuation is entirely absent. Dr. Kennedy states, that in certain epidemics of this disease, "scarcely an individual case has manifested this symptom. Sometimes very large quantities of serous fluid are ejected with great force; at others, the contents of the stomach are brought up, without any effort, by an action apparently of the œsophagus, somewhat similar to that which occurs in rumination. The animal functions also are disordered in very different degrees. In some cases the patients have been able to "walk, and to perform many of their usual avocations," even after the circulation of the blood was so much arrested as to render the pulse imperceptible at the wrist. In the majority of cases, however, the animal functions are early impaired, and in some instances great prostration of strength occurs as the disease is developed.

Spasm has been regarded as an essential phenomenon of this malady. Observation, however, does not confirm this opinion; for cases have been noticed in which all the other symptoms characteristic of this malady were present, without any spasmodic affection of the muscles of voluntary motion. The spasms are generally much more violent in robust and athletic habits, than in such as are of feeble and relaxed habit of body. "In the low and most dangerous form of cholera, spasm is generally wanting, or is present in a very slight degree." (Kennedy.) The spasms in this disease are of a mixed nature, partaking more of the tonic than the clonic character, "the relaxations being less prompt and frequent than in epilepsy or convulsion, and seldom durable as in tetanus." In some instances spasmodic twitchings of the muscles have been noticed a considerable time after death.

The blood undergoes a remarkable change in this disease. The profuse aqueous discharges by the stomach and bowels, as well as by the skin, soon deprive this fluid of nearly the whole of its serous portion, in consequence of which it acquires a much darker color and thicker consistence than natural. When a vein is opened in the stage of collapse, only a few drops of thickened black blood issue from the orifice, or at most, it trickles down the arm like a stream of treacle. "By pressure and friction, perhaps, it begins to flow more freely, and if it continues, the color gradually improves. When this is the case a singular appearance is occasionally observed:—the stream consists of two distinct and separate portions, running side by side, the one still dark and tenacious, the other bright, of thinner consistence, and running with greater velocity." (Haslewood.) The blood taken from a cholera patient coagulates speedily into a loose gelatinous looking substance, of a very dark color, without separating any serum.

From the foregoing description, it is manifest that the series of phenomena which characterize this malady, divide themselves into three distinct stages—viz. 1, the stage of irritation; 2, the stage of collapse; and 3, the stage of reaction. The first stage, however, is not always recognized, nor is it attended with any phenomena that can be regarded as peculiar to cholera, or as affording satisfactory diagnostic indications of its presence. It exhibits a more or less obvious state of morbid excitement of the nervous system, and disorder of the gastric and intestinal functions, "which may arise from various causes, and pass away without being followed by the diagnostic symptoms of cholera." The characteristic or diagnostic symptoms of cholera do not exhibit themselves until the disease has advanced to its second stage; and it is only in this fully developed state of the disease, that it can be certainly recognized. The phenomena which characterize this stage of the malady, are; 1, frequent discharges from the stomach and bowels of a serous or watery fluid, resembling rice or barley water; 2, complete suppression of the biliary and urinary secretions; 3, profuse cold and clammy sweat; 4, a failure and almost total suspension of the action of the heart and arteries; 5, complete failure of the animal heat, as evinced by the icy coldness of the surface, and the cold tongue and breath; 6, a livid or bluish hue of the skin, with a corrugated state of the hands and feet; 7, a thick and black state of the blood; 8, spasms or cramps of the muscles, commencing in the extremities and proceeding to the trunk; 9, an early and extraordinary alteration of the expression of the countenance; 10, and finally, with all these violent symptoms, an almost undisturbed state of the mental faculties and sensorial powers.

It is manifest from this assemblage of symptoms, that the diagnosis of cholera, when fully developed, can very rarely be attended with any material difficulty. The disease with which spasmodic cholera would seem most liable to be confounded, is the ordinary cholera—the cholera biliosa. "Where the evacuations are tinged of a yellowish or greenish hue, where the matter vomited is bitter to the taste, while the skin remains warm and the pulse good, the disease may, with confidence, be regarded as ordinary bilious cholera; but where, after the first emptying of the primæ viæ, the evacuations are of a watery consistence, colorless, turbid, or white—when no urine is voided, when the surface becomes cold, the features collapsed, the spirits depressed, and the pulse flags, the case may almost certainly be regarded as cholera asphyxia." (Kennedy.) In the more advanced period of the disease, the total cessation of the pulse in the extremities, the icy-cold and clammy skin, the shriveled, corrugated and bluish appearance of the hands and feet, and the general depression, can leave no doubt as to the nature of the malady.

Post-mortem appearances.—The external appearances of subjects who have sunk under this disease do not differ materially from those which the body presents during the latter period of the stage of collapse. The surface exhibits a livid, purple or blue color; the skin of the hands and feet is corrugated; "the eyes are deeply sunken, and have a dark ring around the orbits; the flexor muscles are rigidly contracted, the tendons standing out prominent on the extremities;

the hands are firmly clenched, requiring an effort to open them. The uvula, tonsils, and pharynx are covered with granulations, as is likewise the base of the tongue. These granulations vary in size from that of a pepper-corn to that of a pea, and are probably the mucous follicles altered by inflammation. They contain a yellowish pus, of more than ordinary consistence. The œsophagus is corrugated; the mucous membrane of the stomach is often thickened, and of a delicate pink or brownish-yellow color, with spots of redness as if from recent inflammation. These red spots have often little rounded vesicles of the shape and size of half a pea projecting from the centre, containing a small quantity of liquid pus. These vesicles are often numerous, particularly in the small intestines. They are probably mucous follicles altered by inflammatory action. The stomach and intestines are generally filled with a turbid liquid like rice water, with little flocculi of a white membranous substance floating in it. The glands of Peyer are enlarged in cases where the disease has been protracted into the typhoid state. The glands of Brunner are often in these cases rendered visible, as large as pepper-corns, and have black points at their centre. The valvulæ conniventes of the duodenum are flaccid, thickened, and swollen, covered with the little vesicles just mentioned, and occasionally they are ulcerated. The peritoneum is dry, and has a shining opaline lustre. The bile ducts are often thickened and are generally open; the liver is considerably gorged with blood; the spleen generally small and flaccid; the heart contains black blood in all its cavities, and is soft and easily torn; the blood is imperfectly coagulated, resembling thick molasses. The pulmonary veins contain clots of yellow coagulated lymph, tremulous like jelly."

The trachea contains frothy mucus of a reddish or brown color. The mucous membrane of the larynx is often red and congested. The lungs are seldom engorged with blood, and almost always crepitate well; the veins of the kidneys are turgid with dark uncoagulated blood; the bladder is usually firmly contracted into a small mass, beneath the pubes. The sinuses of the brain are always much engorged with very thick black blood. The brain itself is, generally, firm, tough, and dry, and in cases where the disease was of long duration, or where death took place in the stage of reaction, it has always been found highly congested, with more or less opacity of the arachnoid membrane.* Dr. C. T. Jackson states, that he has often found the semilunar ganglion enlarged, and of a deep red color, and sometimes softer than natural. "The state of this ganglion, however," he observes, "varied so much that I can give no precise account of its morbid anatomy in this malady. It is obvious that the changes of color in this ganglion might have been the effects of the change in the color of the blood."

Concerning the essential pathological character of this extraordinary malady, very little is known that can be deemed satisfactory. It seems, indeed, very probable that the cause of the disease, whatever may be its nature, acts primarily on the nerves of the mucous membrane of the alimentary canal. In a great majority of cases, the approach of the disease is gradual, exhibiting a train of initial symptoms, clearly indicating a morbidly irritable condition of the stomach and intestines. The impaired digestion, the diarrhœa, or constant tendency to diarrhœa, the rumbling noise of flatus in the bowels, the pain or uneasy feeling in the pit of the stomach, the headache, the quick and sharp pulse, these symptoms so generally noticed, where the premonitory stage is recognized, show very conclusively, that the first obvious morbid effects of the cause of cholera is derangement of the gastric and intestinal functions. This primary irritable and deranged state of the alimentary canal is more or less speedily followed by a rapid sinking and apparently total loss of the vital energy of the nerves subservient to the functions of organic life. The functions of the liver and kidneys are wholly suspended; the lungs cease to exert their appropriate vital influence on the blood and inspired air; the vital actions, by which animal heat is developed, are almost wholly

* Dr. C. T. Jackson—Medical Magazine, No. 4, 1831. See *Amer. Journ. of the Med. Sciences*, vol. xi. p. 266.

arrested—in short, the whole machinery of *organic* life is tending rapidly to a state of total inaction, as if from palsy; whilst the organs subservient to the animal functions—the intellectual, the sensorial, and locomotive powers are in general but slightly affected. The very thick and dark state of the blood, depends on the rapid and almost total loss of its serum, by the relaxed exhalants of the alimentary canal and skin, and partly also, on the retention of the recrementitious carbonaceous matter, in consequence of the suspension of the pulmonary and hepatic functions. Dr. Jackson of Philadelphia rejects the opinion, that the feebleness or suspension of the organic functions—the weakened state of the heart, and the functional torpor of the liver, lungs, kidneys, &c., depend on a loss of power in the ganglionic system of nerves. "The facts of the disease," he says, "give no countenance to this supposition. The insufficiency of this explanation is palpable, and we must resort to the more direct, obvious, and quite adequate cause, found in the exhaustion and alteration of the circulating fluids by the excessive evacuations from the stomach, bowels and skin." The blood, he says, is speedily deprived of nearly the whole of its serous and saline portion. "It is then no longer sufficient in quantity to fill up the vascular and angeal apparatus. Shrinking and shriveling, first of the remoter tissues, capillaries and vessels, ensue; the blood no longer filling the calibre of the arteries, the pulse disappears, and the heart losing its accustomed stimulation, acts with diminished energy." In consequence of this condition of the blood and the heart he thinks the lungs, the liver and the kidneys, cease to perform their functions. This explanation is indeed sufficiently "direct and obvious," but I doubt much, whether it will be deemed "quite adequate." If the diminished quantity and changed state of the blood were the sole cause of the functional torpor of the excretory organs and heart, how is it that the voluntary muscles, the organs of sense, and the brain continue to act with no remarkable reduction of power, even after the pulse is extinct in the extremities? Can it be presumed, that the morbid condition of the blood would thus prostrate the powers of the heart, lungs, liver and kidneys, and yet, at the same time, permit the brain and muscular system to act with nearly their ordinary vigor? It should be observed, too, that in some instances, the attack of the disease is so sudden and vehement, that the pulse ceases in the extremities, at the very commencement of the attack, and before the discharges from the stomach, bowels, and skin can have drained the blood-vessels of their serum. It is certainly a very remarkable circumstance, that the organs supplied with cerebral or spinal nerves should be, comparatively, so little affected whilst those supplied by the ganglionic or sympathetic system of nerves, are so deeply implicated in the malady.

Cause.—Whatever may be the nature of the remote or specific cause of cholera, it is manifest that all individuals are not equally susceptible of its deleterious influence. The natural or constitutional predisposition to disease consists, probably, in a naturally delicate and irritable state of the mucous membrane of the alimentary canal—a condition "which may have shown itself, on a former occasion, in a peculiar liability to disorders of the stomach and bowels, from slight causes, or by habitual tendency to diarrhœa and dyspepsia." An excitable and easily subdued nervous system may also be regarded as constituting an aptitude to the influence of the cause of cholera. In individuals of this habit, the depressing effects of fear and terror must be peculiarly apt to give force to the cause of this disease. Among the accidental causes of increased predisposition to cholera, the following are regarded as the most detrimental. Poverty and its too frequent concomitants, filth and mental depression, together with deficient and crude aliment, have in all countries, and in all ages, co-operated most powerfully with epidemic causes in multiplying their victims. The broken down in constitution, habitually intemperate, and the dissolute have everywhere been the first and most certain sufferers. Exposure to a cold and humid atmosphere, particularly at night; excessive fatigue of the body; inordinate mental excitement—the abuse of spirituous liquors—and crude, indigestible, and irritating articles of

food, are particularly calculated to favor the developmont of cholera, in persons exposed to the influence of its cause. The articles of diet which have been found most injurious in this respect are salt pork, warm pastry, spawn of fish, hard-boiled eggs, smoked meats and fish, melons and cucumbers, lettuce, radishes, cheese, sausages, raisins and nuts. Everything, in short, which has a tendency to irritate the stomach, or which requires strong digestive powers, ought to be carefully avoided during the approach or prevalence of this epidemic. Excess in eating, whatever may be the nature of the diet, may give efficiency to the remote cause of the disease. Protection from the cool and damp night air, and from atmospheric inclemencies and vicissitudes, by good lodging and warm comfortable clothing—cleanliness, fresh air, the avoidance of excess in diet and drink —a cheerful, confident, and equable state of mind—the absence of inordinate personal fear, with a simple, nutritious, and digestible diet—these advantages will go far towards protecting the system from the deleterious influence of the epidemic causes.

What is the nature of that deleterious principle which gives rise to cholera? Upon this subject all inquiries have hitherto resulted in little else than vague conjecture. Some ascribe this malady to an aërial poison, generated by the decomposition of vegetable and animal matter. This opinion is met with the objections, that the disease has prevailed at all seasons, in winter as well as in summer, and in localities where the materials for such miasmata were, to all appearances, too sparingly present for the production of an epidemic. Others have supposed the choleric cause consists of a poisonous air or affluvium, engendered deep beneath the surface of the earth, by a slow process of decomposition or chemical change in some mineral strata, or by central volcanic action. There is certainly something very analogous between the effects of the choleric cause, and those which result from mineral poisons, particularly arsenic. The slow progress of the disease for the period of more than seventeen years, in a broad zone over the surface of the earth; often in opposition to the regular currents of the wind, seems to accord well with what one might suppose would be the progress of an epidemic if it depended on a subterranean cause of this kind.

There are some who are disposed to believe, that the cause depends upon some occult modification in the constitution of the atmosphere itself. But this opinion is met by the objection, that, if such were its origin, it could hardly have advanced in a direction contrary to the prevailing current of the air, or winds—a circumstance which has frequently been observed. A few writers contend, that the disease depends on a deficiency of the electric fluid in the atmosphere, whereby the animal system is deprived of its most subtle and pervading stimulus, and the organic functions debilitated. The disease has also been ascribed to the influence upon the human system of some change in the magnetic condition of the earth; and Hahnemann, with a few other writers, has adopted the Linnean doctrine, of animalcular origin. It is maintained by the advocates of this hypothesis, that cholera arises from an infinite number of animalculæ, too small to be perceived by the most powerful microscope, which, floating in the atmosphere, enter into the lungs, and alimentary canal, and thence make their way into the current of the circulation. This opinion is ingeniously and zealously defended by Dr. Neal, in a late work, written expressly to illustrate this view of the subject.

It is unnecessary, here, to enter into a discussion upon the various points involved in these opinions. It may be sufficient to observe that they are all, as yet, wholly conjectural; and that the experience and observation of the profession, though intently directed to this object, have, hitherto, failed in establishing anything on the subject which can be regarded as possessing any considerable degree of probability.

Does the human body, laboring under cholera, engender a poison, which, when brought to act on a healthy individual, will give rise to the same distemper; in other words, is the disease communicated from the sick to the healthy in the

manner of a contagion? This is an important question. The fatality and calamitous consequences of epidemics, are always greatly augmented, by the conviction among the people that the reigning disease is contagious. Besides the unhappy effects on the minds of the people, the vexatious, and often ruinous sanatary restrictions and quarantines, to which the existence, or supposed existence, of contagion usually leads, are in themselves evils of very great magnitude, and never fail to augment both public and private distress.—Where the evidence of contagion is so slight, therefore, that the most careful and judicious observers are led to entertain strong doubts of its existence, it is manifestly the duty of those whose station gives them an influence over public opinion, to discourage the belief in the prevalence of contagion. If the authority of those who have witnessed epidemic cholera is to be taken as evidence on this point, the foundation for the opinion of its contagious character is but very slight. It is stated that in India, ninety-nine out of one hundred physicians believe that cholera is *not* contagious; and in every country and district that has been invaded by this disease, a great majority of the most experienced and enlightened of the profession entertain the same conviction. In many populous cities and districts, as at Moscow, Orenburg, and Paris, the majority of medical men, as well as of citizens, did not doubt the contagious character of the disease while they contemplated it at a distance; but after it had made its appearance amongst them, and they were furnished with an opportunity of observing for themselves, the belief in its contagiousness was almost universally abandoned. The quarantine regulations and sanatary restrictions which were enforced with the utmost vigilance and rigor at London, Paris, Hamburg, and other places, when the disease first broke out, were, on further experience and inquiry, so greatly relaxed as to demonstrate, in the clearest manner, the change of sentiment which took place under the light of experience, in relation to this point. There is not, I am persuaded, a single *unequivocal* instance on record, of the direct communication of this malady from the sick to the healthy. It is true that many *apparent* examples of this kind have been adduced, but these have always been attended with circumstances of doubt and uncertainty; whilst on the other hand innumerable instances have been noticed, wholly inconsistent with the supposition of contagion. Were some one of the unequivocally contagious diseases—were small-pox, for instance, now, for the first time, to appear amongst us, can it be imagined, that after an almost universal prevalence, during a period of more than seventeen years, the contagious character of the disease would not have been incontestably established? In the report of the extraordinary committee of health, at Moscow, it is stated "that at the opening of bodies of persons who had died of cholera, to the minute inspection of which four or five hours a day, for nearly a month, were devoted, neither those who attended at the operations, nor any of the assisting physicians, nor any attendants caught the infection, although, with the exception of the first day, scarcely any precautions were used." In the cholera hospital of this city, (Cincinnati,) in which, during a period of nearly five weeks, there were constantly from fifteen to twenty cholera patients, not a single case of the disease occurred among the attending physicians, nurses, and other attendants, although some of these remained in the wards day and night, during the whole period, and frequently slept on beds in which cholera patients had lain and died. Dr. Walker, speaking of the disease as it prevailed at Moscow, says, that "persons had put on the clothes of patients who were very ill, or had died of cholera—had lain in their beds, and even alongside of dead bodies—had bathed in the same water where very bad cholera patients had been bathed just before, and that, notwithstanding, not one of these individuals was attacked with the disease." Without pursuing this subject any further, it may, I think, be safely asserted that the cause of cholera was originally, and still continues to be generated by circumstances foreign to the human body; and that it is propagated by being diffused throughout the atmosphere.

Treatment.—In the treatment of cholera, much depends on a proper atten-

tion to the different stages of the disease; for the remedies and mode of management best adapted to one stage, would be wholly inefficient, or even injurious, at another period of the complaint. "A misapplication of the remedial measures," says Dr. Kennedy, "has been the source of extraordinary confusion and contradictory testimony. Several remedies, on which the strongest dependence is to be placed, in the management of cholera, have fallen repeatedly into temporary disgrace, from their having been prescribed in stages of the disease when their use was altogether improper."

The premonitory period.—When the patient complains of irregular appetite, disordered digestion, a sense of fullness, or uncomfortable feeling in the epigastrium, unusual heat in the abdomen, noise and commotion in the bowels, diarrhœa, or a peculiar feeling as if diarrhœa would on the slightest effort come on;—when these symptoms are present, the *indications* of cure are: 1. To correct the intestinal and hepatic secretions, and allay the vascular and nervous irritation of the alimentary canal. 2. To regulate the diet, so as to adapt it to the irritable state of the stomach and the disordered condition of the digestive functions. To accomplish these purposes a simple, unirritating and digestible diet must be enjoined, such as stale wheat bread, water and soda crackers, rice, hommony, grits, barley or oatmeal gruel, chicken or mutton broth, beef tea, black tea, or weak coffee with cream; and for common drink, toast-water, barley or rice-water, or weak cold chamomile tea. Ten or twelve grains of calomel with one grain of opium should be immediately administered, and afterwards one of the following pills, every two, three, four or six hours, according to the urgency of the symptoms. ℞.—Submuriat. hydrarg. ℈i; g. opii grs. ii; pulv. camph. grs. v.—M. Divide into five pills. The patient should not be permitted to walk about or even to sit up. If the extremities are cool and the surface pale and shrunk, the patient should bathe his feet in warm water impregnated with salt, then lie down in bed well covered, "with warm applications to the feet, as bottles of warm water, warm bricks, irons, or bags of heated oats, or sand, &c.* When at this early period the patient complains of nausea, I have found nothing so effectual in giving relief as small doses of a solution of camphor in sulphuric ether. From six to ten drops every twenty or thirty minutes of a solution of thirty grains of camphor in an ounce of the ether, will seldom fail to allay the nausea and vomiting at this stage of the complaint. This solution, with the addition of small doses of laudanum, is particularly beneficial where the incipient stages are attended with symptoms of a decidedly nervous character. Dr. Samuel Jackson states, that in cases of this kind, he has frequently used the following prescription, with the most satisfactory results: ℞.—Tinct. lavand. compos.; tinct. camphoræ, āā ℥iv; liq. Hoff. anod., tinct. opii, āā ℥ij.—M. ft. mist. From ten to twenty drops of the above are to be administered at appropriate intervals. By the preceding mode of management, the premonitory or incipient symptoms of the disease have, in a large majority of instances, been speedily and effectually subdued, and the full development of the disease prevented. After the irritable state of the stomach and bowels has been allayed a mild purgative should be ordered. For this purpose powdered rhubarb, or the compound extract of colocynth, or fresh castor oil, will answer very well. The operation of the purgative should be followed by an anodyne. During convalescence from these symptoms, and, indeed, for a considerable period after their disappearance, the patient ought to use a mild, digestible and nutritious diet, and especially, to avoid over-distending the stomach with food or drinks. Many relapses have occurred in consequence of some error in this respect.

If, notwithstanding these remedial measures, the disease assumes a more serious character—that is, if the evacuations begin to assume, or have assumed, the appearance of rice-water, and the patient experiences cramps in the extremities—then the primary objects are, to allay the cramps, vomiting, and purging, and to

* Dr. Samuel Jackson, Amer. Journ. of Med. Sciences, vol. xi. p. 324.

support the action of the heart and capillary circulation. From eight to ten grains of calomel, in union with half a grain of opium, should be given every hour. Many respectable authorities recommend much larger doses of calomel, whilst others, of equal respectability, employ it but sparingly. That calomel is a valuable remedy in this disease admits, I think, of no doubt; but my own experience has fully convinced me, that all the benefits which this remedy can afford may be obtained from the doses I have just mentioned.* To allay the nausea and vomiting, the ethereal solution of camphor, already mentioned, is an excellent remedy. From ten to twenty drops should be given every half hour or hour, according to the urgency of the symptoms. Dr. Jackson recommends the following mixture for this purpose, and I have no doubt of its usefulness. R.—Bi-carbon. potassæ ℥iv; acetat. opii gtt. xv; aquæ camphoræ ℥iv.—M. ft. solut. Half an ounce, mixed with an equal quantity of lemon-juice, should be taken in the act of effervescing, every half hour. A sinapism should be laid over the abdomen, and *dry heat assiduously applied to the extremities.* The employment of the *warm* bath has been strongly recommended by some writers; but the relaxing and debilitating effects of the bath, together with the agitation and fatigue of the body almost necessarily attending its use, have often done very serious injury. In the "*India Reports of Cholera*" many instances are mentioned "where the warm bath, in the second stage of cholera, manifestly hastened the death of the patients." These objections do not apply to the use of the *alcoholic vapor bath.* This application may be made without disturbance or fatigue to the patient; and I have known it to be resorted to, in the early periods of the disease, with very decided advantage. There is no remedial measure that has been more urgently advocated by some, and more strongly reprobated by others, than *sanguineous depletion.* To draw blood from the body, in a disease so strongly and so certainly tending to total prostration of the vital powers, does, indeed, at first sight, appear very unpromising. Ample experience, however, has satisfactorily established the fact that, in the early periods of the disease, before collapse of the vital energies has taken place, and in subjects not enfeebled by age or previous ill health, blood-letting is sometimes attended with the most favorable results. Many of the most respectable physicians of India speak in strong terms of praise of the effects of general bleeding in cholera. Dr. Taylor, in his report to the president of the Bombay Medical Board, says that, "when the principal symptoms are great oppression at the breast, laborious breathing, and a feeling of suffocation, or when the patient was affected with general tremors, giddiness, or locked jaw, bleeding was the only remedy which afforded effectual relief. But while blood-letting, in the early stage of the disease, and under certain circumstances, almost uniformly produced the most decided salutary effects, it was, in general, unavailing in the latter stages, when the limbs were cold, the pulse not to be felt, and the eyes fixed and sunken." Indeed, when once the disease has advanced to the state of collapse, it is almost impossible to procure the discharge of blood, which merely trickles forth in drops, and often fails entirely to issue from the orifice. Dr. Kennedy, in his excellent treatise on this disease, declares that "every patient from whom blood could be freely obtained was almost sure of recovery;" and this declaration is supported by the majority of his medical brethren in India. In our own country, many physicians of the highest respectability have recorded their testimony in favor of general blood-letting in this malady. Dr. Hopkinson, of Philadelphia, a young physician, rising rapidly to eminence and distinction in his profession, says, "to overcome or remove the universal venous congestion in cholera, there *is no substitute for venesection.* The blood must be drawn *from a vein.* It will not do

* By some of my western brethren the dose of calomel I have stated above, will be deemed very inadequate. The quantities of this article which have been administered in cholera by some highly respectable western physicians are, indeed, truly enormous. I have it from unquestionable authority, that in not a few instances, *one pound and a half, at least*, has been given to the patient, in the course of forty-eight hours.

to open an artery; this exhausts the patient, but does not relieve the *venous congestion*. If the pulse is not perceptible, or if it be very feeble, it is better to begin by applying cups over the abdomen; and if then the pulse rise, we may open a vein in the arm or in the foot, and watching the pulse, let the blood flow until reaction, or the improved condition of the patient indicates the attainment of our object." These precepts accord fully with my own sentiments on this subject.

Local depletion by cupping or leeching is by some regarded as, in general, decidedly preferable to blood-letting from a vein; and doubtless, in many cases, it is capable of affording all the advantages that can be derived from depletion, with less risk of hastening prostration than would attend the opening of a vein. In the early period of the disease, when the pulse is yet moderately full and active, almost immediate relief sometimes follows the application of leeches or cups to the epigastric and iliac regions. Dr. Samuel Jackson says: "It is surprising to witness how prompt, often, is the alleviation and abatement of the symptoms, following the application of from thirty to sixty leeches to the epigastric or iliac regions. In no instance did I find it necessary, in the patients I treated, in the first stages, to repeat the local depletion. One application was sufficient to procure a favorable result. In several instances general depletion made but little impression, whilst prompt relief ensued upon local depletion."

It was not until near the termination of the last epidemic cholera in this city that I ventured on sanguineous depletion in its remedial management; and the few cases in which I at last adopted this practice gave me cause to regret, very much, that I had not sooner resorted to this important remedy in the treatment of this malady. As a general rule, local bleeding, by cupping or leeching, is, without doubt, preferable to venesection; but when the pulse is moderately full and active, and the patient not of a feeble and nervous habit, blood may be freely drawn from a vein with little or no risk of injury, and generally with decided advantage. But besides the general abstraction of blood, and consequent relief of the internal venous congestion, which the application of leeches or cups to the epigastrium affords, in common with venesection, it has the additional advantage of acting more directly on the abdominal organs, and, by its derivative and sedative effects, of obviating the congested and irritable condition of the stomach and bowels.

To allay the thirst, which is generally extremely harassing, the patient must be allowed to drink weak iced lemonade, iced gum water, barley water slightly acidulated and sweetened, artificial Seltzer with or without lemon syrup, and iced water in small quantities. When the thirst is attended with a sense of heat and burning in the stomach, much relief may often be obtained by swallowing small pieces of ice. "In many instances," says Dr. Jackson, "ice itself was given in very small pieces," and the effect, he states, was most grateful, and manifestly salutary.

If the disease advances, and the temperature of the body and action of the heart begin to sink—if the pulse becomes small and feeble, and the hands and feet assume a corrugated and livid appearance, unceasing efforts must be made to sustain the activity of the capillary circulation, and the warmth of the body. Frictions with flannel moistened with a strong infusion of capsicum, or some other irritating liniment, or dry frictions with a flesh brush, together with sinapisms to the abdomen and extremities, are best adapted to answer this intention. It will also be proper to administer stimulants internally; such as small portions of brandy and water, ammonia, turpentine, ether, &c.

To check the excessive serous discharges from the stomach and bowels some practitioners have advised the internal employment of the *sugar of lead*; and from what I have seen of its effects in this disease, I am inclined to think that much advantage may often be derived from it in this respect. Two grains of the *acet. plumb.* in union with a grain of camphor, may be given every half hour, until the watery discharges cease; or from twenty to thirty grains, dis-

solved in a small quantity of water, may be injected into the rectum. I have employed this article, in both these ways, in three or four cases; and as it appeared to me, with a very manifest effect in diminishing the quantity and frequency of the serous evacuations.

When the disease has advanced to the third stage, or the state of collapse, the treatment already mentioned must be continued; and to restore the fluids drained from the blood-vessels, by the excessive discharges through the stomach, bowels, and skin, the patient should drink freely of some agreeable beverage, such as barley water, rice water, water mixed with a small portion of brandy; soda water, Seltzer water, or weak chicken, mutton, or beef tea. As soon as the evacuations have ceased, or are suppressed, the opium which was directed with the calomel, should be omitted, or given only in very small portions. When freely given in this stage of the disease, opium may do serious injury, either by blunting the sensibility of the system, already too torpid, or by promoting a dangerous determination to the brain, should reaction take place. To persons who have been intemperate, or who have been addicted to the use of spirituous drinks, stimulants must be pretty freely allowed, in this stage of the disease. The carbonate of ammonia is an excellent stimulant for this purpose, and generally agrees better with the stomach than any other remedy of this kind.

Much has been said in favor of *mustard emetics* in the collapse or "blue" stage of cholera. Dr. Gibson, of Sunderland, declares that he has employed this remedy with the happiest effect in the advanced stages of the disease; and Greenhow says, "In the cold, blue or pulseless stage of the intense type of the disease, I believe it to be a very valuable remedy in relieving the irritation of the stomach, and exciting reaction." In this city, the mustard emetic was employed both in this and in an earlier period of the disease, by several of my medical brethren, and, I have understood, often with decided advantage. My own experience, however, has not furnished me with any evidence of the usefulness of this practice in the stage of collapse; but I have derived very manifest advantage from this emetic at an early period of the disease.* The tendency of forcible vomiting to excite the action of the heart and arteries and to impel the blood from the central vessels to the circumference, is indeed well known; and it does not appear improbable, therefore, that any article which is capable of producing a sudden and vehement vomitive exertion, should occasionally give a salutary impulse to the circulation in this malady.

Dr. Stevens, conceiving that the proximate cause of cholera consists in a deficiency of the saline elements of the blood, administered the *non-purgative salts;* and the result, he informs us, was highly encouraging. In the account which he gives of his experience with this remedy, he states, that in some cases, where the pulse had already ceased in the extremities, the administration of the carbonate of soda was speedily followed by a return of the pulse, and an increased temperature of the body. This treatment has been adopted by many other physicians, both in this country and in Europe, and several statements have been published strongly in favor of its usefulness. Mr. Wakefield, an English physician of great respectability, declares that he employed this remedy in the cholera as it occurred in the prison at Cold Bath Fields, with extraordinary success. Fifteen fully developed cases of cholera were "put under the saline treatment, and all of them recovered. When the patients were first admitted, the following powder was immediately given, either in half a tumbler of tepid water, or occasionally, in a little thin, clear beef tea. ℞.—Supercarbonate of soda ℥ss; muriate of soda ℈i; chlorate of potass grs. vii. This was repeated every hour, and continued until the patients were recovering from the state of collapse; after which it was diminished in frequency in proportion as the reaction increased."†

* The mustard emetic is thus prepared. Dissolve a teaspoonful of common salt in a gill of warm water, and then mix with it a teaspoonful of finely powdered mustard. This is to be taken at one draught.

† London Med. Gazette. Amer. Journ. of Med. Science, vol. x. p. 51.

When the stomach is very irritable, the tartrate of soda, in a state of effervescence, is said to be the most agreeable and effective form of administering the alkali. Mr. Wakefield advises, that, in addition to the use of the powder just mentioned, enemata should be administered, every two or three hours, composed of a large tablespoonful of muriate of soda, dissolved in warm water. Mr. Whitmore states, that of eleven cases of cholera, which occurred "amongst a small colony of Italians, the first three were treated by bleeding, brandy and opium, and they all died. The other eight cases were put under the saline treatment, as recommended by Mr. Wakefield, and all but one, speedily and completely recovered." In accordance with the sentiments of Dr. Stevens, saline fluids have, also, been *injected* into the veins in the cold or "blue" stage of this malady. Dr. Thomas Latta, of Leith, resorted to this practice, in a considerable number of cases; and he assures us, that, "in every case, even the most desperate cholera symptoms were removed." The quantity of saline fluid injected, amounted in some few instances to one hundred and twenty ounces; and, it would appear that, unless the quantity introduced into the veins is very considerable, (from eighty to one hundred and twenty or thirty ounces,) no reliance can be placed on the permanency of its beneficial effects. In New York and Philadelphia, this remedy was repeatedly tried, and a few cases have been mentioned in which it proved successful. Both this and the preceding mode of employing alkalies in this malady, have entirely failed, in the hands of many judicious practitioners, and however successful this mode of treatment may have been, in the practice of some, its claims to particular attention are still very doubtful. I have seen the carbonate and tartrate of soda freely administered, in six or seven cases, in the cholera hospital of this city, without, in a single instance, observing any decided beneficial effects from its influence.

Dr. Charles Lee, of the Greenwich Hospital, New York, relied wholly on the employment of external applications, for exciting reaction in the stage of collapse. "At first," he says, "we relied on powerful internal stimulants and external revulsives; but our success was small; no permanent reaction could be produced. At length I concluded that there was no absorption from the mucous membrane; that from the violent action it had undergone, its functions were lost, and brought into the same condition as that of the skin. The only thing then left, was to undertake to introduce medicines into the circulation mechanically, through the skin. The indications were, to restore the circulation, relieve spasm, promote the action of the absorbents, and unlock the secretions. To effect these objects, I prepared the following mixture. ℞.—Strong mercurial ointment ℔i; powdered camphor ℔ss; powdered Cayenne pepper ʒiv. Mix well together, and have the patient rubbed all over for half an hour at a time, and repeat the operation, accordingly, till the mouth is affected. *The success of this plan was perfectly astonishing.* Without administering a particle of medicine internally, reaction is sure to follow, in from one to three hours, *even in the most perfect collapse.*" This plan of treatment appears to be well adapted to fulfil the principal indications in cholera; but it is extremely doubtful whether this, or any other remedy, can avail aught in the state of "perfect collapse." When the disease has proceeded to this extent, all remedial efforts are probably wholly unavailing; and if recovery from perfect collapse does take place, it must be the result, rather of a spontaneous effort of the vital energies, than of any remedial impulse.

The application of irritating applications over the tract of the spine, is said to have produced very excellent effects in the spasmodic and more advanced periods of the disease. Sinapisms, tartar emetic ointment, and turpentine, have been employed for this purpose. In a case which occurred in the practice of the late Dr. Staughton, the application of cups over the spine, just as the patient was passing into a state of collapse, was speedily followed by decided melioration of the symptoms. Would not the application of moxa to the epigastrium and spine prove beneficial in this disease? M. Petit, of the Hotel Dieu, in Paris, thinks, that the principal indication to fulfill, in the treatment of cholera, "is to keep up

a constant impression upon the spinal marrow." With this view, he applies "over the whole tract of the spine, a strip of flannel, wet with a liniment composed of an ounce of the spirits of turpentine, and a drachm of aqua ammonia, and passes slowly over it a very hot flat-iron." This almost immediately produces vesication; and is, we are told, generally speedily followed by a return of the warmth of the skin, renewed activity of the circulation, and cessation of the vomiting and cramps. In addition to this application, frictions of the extremities, with a decoction of mustard, to which some aqua ammonia is added, must be diligently made.

If reaction takes place, there is generally much danger of excessive determination of blood to the head; and many cases have terminated fatally, from sudden oppression of the brain, producing violent delirium or coma, or even convulsions, in the stage of reaction. During the first five or six hours after reaction commences, the case ought to be carefully watched, and the febrile action moderated, if it tends to become violent, by blood-letting. Very often, indeed, delirium or deep coma ensues, with but a moderate degree of arterial reaction, as indicated by the pulse. In cases of this kind, sinapisms, or warm applications should be made to the feet, while ice, or flannel wet with iced water, is constantly applied to the head, having previously applied leeches or cups to the temples.

During convalescence from cholera, the diet should be mild, digestible, and nourishing—and the patient ought to be particularly cautioned against indulging too freely in eating. Above all, he should avoid crude vegetables, and rich pastry. Dr. Kennedy states that a copious draught of cold water, during convalescence from this disease, has frequently brought on a relapse. Fatigue of body and mind, too, ought to be avoided, more especially in persons of a weak and delicate habit of body.

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GLOSSARY.

*** *As it is probable that this book may be purchased for family reference, the Publisher has added a Glossary of the technical terms used in the Work.* J. G.

A.

ABDOMEN, the belly, or paunch.
Abscess, a collection of matter.
Adipose, fat.
Anasarcous, dropsical.
Anginose affections, inflammatory affections of the throat.
Anormal, irregular, unnatural.
Anthelmintic, having the power of destroying worms.
Antiphlogistics, medicines that reduce fever and inflammation.
Antispasmodics, medicines that allay spasms or cramps.
Aperients, medicines that gently open the bowels.
Aphthæ, small superficial ulcers in the mouth.
Apyrexia, the period of intermission in agues.
Ardor urinæ, a scalding urine.
Arthritis, rheumatic pains of the joints.
Asphyxia, apparent death, suspended animation.
Asthenia, diminished vital energy.
Axungia, hog's lard.

B.

Belladonna, deadly nightshade.
Blennorrhœa, a morbid secretion of mucus.
Bronchia, the air tubes in the lungs.
Bronchotomy, an incision into the windpipe.
Bulimia, insatiable craving for food.

C.

Cachexia, a general weak, relaxed, and disordered state, without fever.
Canthus, angle of the eye.
Capillary vessels—Capillaries, the very minute vessels between the arteries and veins.
Cardia, the upper orifice of the stomach.
Cardiac region, the pit of the stomach.
Carotids, the arteries that convey the blood to the head.

Catamenia, the monthly discharge of females.
Cataplasm, a poultice.
Catheter, a hollow tube for drawing off the urine.
Cephalalgia, headache.
Cephalic, relating to the head.
Cerebral, relating to the brain.
Cerebrum, the brain.
Cervical vertebræ, the joints of the spine, in the neck.
Cervix uteri, neck of the uterus.
Chyle, the milky fluid produced by digestion.
Chyme, the food after it has undergone the process of digestion in the stomach, and has passed into the bowels.
Colliquative stools, profuse watery discharges from the bowels.
Collyrium, an eye wash.
Coma, profound lethargic stupor, or sleep.
Comatose, morbidly sleepy.
Congestion, the accumulation of blood in a part.
Constipation, costiveness.
Crassamentum, the red globules of the blood, collected in a mass with the coagulable lymph.

D.

Dejections, alvine, evacuations by the bowels.
Deliquium, fainting.
Demulcents, soothing, mucilaginous fluids, as flaxseed tea.
Dentition, teething.
Derivatives, remedial applications, that draw the blood from an affected part.
Desquamation, scaling off, or separation of the skin in small scales.
Diagnosis, the distinguishing marks of particular diseases.
Diaphoresis, gentle perspiration.
Diaphragm, the muscular partition between the chest and abdomen.
Diathesis, any particular disposition or habitude of the body.
Dietetic, relating to the regulation of the diet.
Diluents, bland drinks.
Diuresis, increased discharge of urine.
Diuretics, medicines that increase the flow of urine.
Duodenum, the first twelve inches of the small intestines.
Dyspnœa, oppressed breathing.
Dysuria, difficulty and pain in passing urine.

E.

Ejections, discharges from the stomach by vomiting.
Electuary, a compound medicine, made into the consistence of honey.
Emesis, vomiting.
Emetic, a medicine that causes vomiting.
Emulsion, a milk-like fluid, formed by mixing oily or resinous substances, by means of mucilage, with water.
Encephalic, relating to the cavity of the skull.
Encephalon, the brain with its membranes.
Endemic, a disease peculiar, or especially prevalent, in certain localities or districts.
Enema, a clyster, an injection; *enemata*, injections.
Engorgement, an accumulation and stagnation of fluids in a part.
Enuresis, involuntary discharge of urine.
Epidermis, the outer skin.

Epispastics, substances that blister the skin, as Spanish flies.
Epistaxis, bleeding from the nose.
Errhines, substances used to produce sneezing.
Erysipelas, St. Anthony's fire.
Erythema, a slight inflammation of the skin.
Eschar, the dead substance produced by applying caustic, &c.
Etiology, relating to the causes and origin of diseases.
Exacerbation, the period of increase of a fever.
Exanthemata, acute eruptive diseases.
Excitability, the capacity of being excited by stimuli.
Excitement, the action caused by stimuli.
Exfoliate, to cast or scale off, as the skin, or a piece of dead bone.
Expectorants, medicines that promote spitting.
Exsanguious, bloodless, with but little blood.

F.

Farinaceous, made of meal.
Fascia, a tendinous expansion.
Fauces, the posterior part of the mouth, or top of the throat.
Febrific, that which causes fever.
Febrifuge, a medicine that has the power of arresting the progress of an intermitting fever; as bark.
Febrile, feverish.
Fistula, a deep tube-like ulcer.
Foramen, an opening, or hole.
Frænum, bridle.
Function, the action or office performed by an organ.
Furfuraceous, branny; consisting of thin light scales.

G.

Ganglion, a small knot or roundish enlargement of a nerve or tendon.
Gangrene, mortification.
Gastralgia, pains in the stomach without fever.
Gastric, relating to the stomach.
Gastritis, inflammation of the stomach.
Gastro-enteritis, inflammation of the stomach and bowels.
Gestation, riding in a carriage, or any locomotion without bodily exertion.
Gustatory, relating to the taste.
Guttatim, by drops.

H.

Hæmatemesis, vomiting of blood.
Hæmaturia, voiding bloody urine.
Hæmoptysis, bleeding from the lungs.
Haustus, a draught of liquid medicine.
Hectic, a slow habitual fever, with sweats and emaciation.
Hemicrania, pain on one side of the head.
Hemiplegia, palsy on one side.
Hemorrhage, bleeding from any part of the body.
Hemorrhoids, piles.
Hepatization, change of structure so as to resemble the substance of the liver.
Hernia, a rupture.
Herpetic, having the character of a tetter.
Humoral, relating to the fluids, particularly the blood.

Hydragogue, a purge that produces watery stools.
Hydrocephalus, dropsy in the head.
Hydropic, dropsical.
Hypercatharsis, excessive purging.

I.

Iatraleptic, the application of remedies externally.
Icterode, yellow, jaundice-like.
Icterus, jaundice.
Idiopathic, original affection of a part.
Idiosyncrasy, any peculiar habit.
Ileum, the lower part of the small intestines.
Iliac regions, the flanks, the lateral and lower parts of the abdomen.
Impetigo, a species of ring-worm.
Integuments, the skin.
Irritability, the capacity of being excited into action.
Ischuria, difficulty or stoppage of urine.

L.

Lactation, the act of suckling.
Lædentia, medicines, or other agents that cause injury.
Lateritious, like brick-dust, brick-colored.
Leucophlegmatic, a pale, relaxed, debilitated, and torpid state of the body.
Leucorrhœa, the whites.
Liniment, a very thin ointment.
Lithiasis, a disposition to discharge gravelly matter with the urine.
Lithontriptic, a remedy used for dissolving stones in the kidneys or bladder.
Lumbago, rheumatism in the loins.
Lymphatics, vessels that carry white fluids.

M.

Malaria, pestiferous exhalations from marshes and putrefying substances.
Meninges, the coverings of the brain.
Meningitis, inflammation of the coverings of the brain.
Metastasis, a translation of a disease from one part to another.
Miasm, the same as malaria.
Morbific, capable of causing diseases.

N.

Narcotic, medicines that blunt the sensibility of the nerves.
Nephritic, affections of the kidneys.
Neuralgia, painful affections of a nerve.
Normal, natural, healthy.
Nosology, a systematic arrangement, explanation, and definition of diseases.

O.

Œdema, swelling from a dropsical collection in the cellular membrane.
Œsophagus, the gullet.
Olfactory, relating to the sense of smelling.
Ophthalmia, inflammation of the eyes.
Opiate, a medicine whose prominent ingredient is opium.

Organic affection, a disease in which more or less of the substance of a part is changed, or disordered.
Orthopnœa, great difficulty in breathing.
Ossified, changed into a bony structure.
Os uteri, mouth of the womb.

P.

Paracentesis, making an opening into the cavity of the abdomen or chest to give exit to fluids; tapping.
Paralysis, palsy.
Parenchyma, the proper substance of organs.
Pathognomonic, characteristic symptoms.
Pathology, doctrine of the causes and nature of diseases. Lately, this term has been, not very properly, applied to the diseased appearances discovered on dissection.
Pectoral, relating to the breast.
Pectoriloquism, a peculiar sound in the lungs when the patient speaks, heard through the sides of the chest by the stethoscope.
Percussion, striking the breast with the extremities of the fingers to ascertain the kind of sound produced.
Pericardium, the membranous sack surrounding the heart.
Peristaltic motion, the vermicular motion by which the bowels push forward their contents.
Pharmaceutic, relating to the compounding, &c., of medicines.
Pharynx, the top of the gullet.
Phlegmasia, inflammation.
Phlegmonous, inflammatory.
Phlogosis, superficial inflammation.
Phimosis, contraction of the foreskin, so as to prevent it being drawn back.
Plethora, fullness of blood.
Pleuritic, of the character of pleurisy, attended with pain in the side of the chest.
Post-mortem, after death.
Prolapsus, a falling down.
Prostate gland, a gland situated at the neck of the bladder.
Ptyalism, salivation.
Pulmonary, relating to the lungs.
Puruloid, resembling pus or matter.
Pus, the yellowish thick fluid or matter formed by inflammation.
Pylorus, the lower orifice of the stomach.
Pyrexia, fever.
Pyrosis, water-brash, or the heart-burn.

Q.

Quartan, a periodical disease returning every 72 hours.
Quotidian, daily; an ague that returns daily.

R.

Rachialgia, colic, with costiveness and vomiting.
Rachitis, rickets.
Ramollissement, softening.
Rete mucosum, the mucous-like expansion immediately under the skin, and in which coloring matter, that constitutes the color of the surface, is deposited.

Rhagades, chaps in the skin, deep fissures in the skin.
Rubefacients, external applications that inflame the skin.

S.

Sanguiferous, conveying the blood.
Sanguineous, bloody, relating to the blood.
Scirrhus, a hard, degenerate tumefaction of a gland.
Sebaceous, suet-like matter.
Secretion, the separation of a fluid or substance from the blood by the action of a living organ.
Secretory vessels, or organs, that separate a peculiar fluid or substance from the blood.
Sedatives, medicines that diminish the actions of the system.
Semicupium, warm bath, the body being immersed only up to the middle.
Sensorium, the brain, the centre of feeling.
Serous, watery.
Strumous, scrofulous.
Subsultus tendinum, a convulsive, sudden twitching of the sinews.
Symptomatic, the consequence of some other affection.
Syncope, fainting.
Synocha, fever of a highly inflammatory character.
Synochus, fever of a sub-inflammatory character.

T.

Tarsus, the edge of the eyelid.
Tenesmus, an ineffectual and painful urging to go to stool.
Therapeutic, relating to the employment of remedies.
Thoracic, belonging to the chest.
Thorax, the chest.
Tormina, griping pain.
Tubercles, small, hard tumors, resembling cheese in their internal structure.
Type, the peculiar form assumed by a fever as to the period intervening between its paroxysms or exacerbations.
Typhoid, resembling typhus fever.

U.

Ureters, the tubes which convey the urine from the kidneys to the bladder.
Urethra, the canal of the penis, through which the urine is discharged.
Utero-gestation, the term of pregnancy.
Uterus, the womb.

V.

Vaccina, cow-pox.
Vesication, blistering.

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