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A TREATISE

OF THE

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MATERIA MEDICA

AND

THERAPEUTICS.

BY JOHN EBERLE, M.D.

MEMBER OF THE AMERICAN PHILOSOPHICAL SOCIETY; OF THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA; CORRESPONDING MEMBER OF THE MEDICO-CHIRURGICAL SOCIETY OF BERLIN, &c. &c.

TWO VOLUMES IN ONE.

SIXTH EDITION, CORRECTED.

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TO

THE FOURTH EDITION.

In preparing the present Edition of this work for publication, the Author has spared no efforts to make it as correct and complete as his means and abilities admitted, and to give it renewed claims to the confidence and patronage of the profession. In relation to the natural history and chemical character of many of the articles treated of, much correction was necessary. Such has been the progress of botanical and chemical researches in relation to the Materia Medica, that a work which, but a few years ago, might have exhibited a satisfactory account of the existing knowledge on these subjects, must now be regarded as deficient, and abundant in error. Upon these points, the author has availed himself freely of the various and accurate information embodied in the Dispensatory of the United States, by Drs. Wood and Bache, undoubtedly the most accurate, comprehensive, and, in all respects, ex-

cellent publication of the kind, extant in the English language. Besides, a great many new facts and observations, introduced into the text of the present edition, the chapters on *Iodine*, *Cahinca*, *Artemisia vulgaris*, *Salicine*, *Polygonum hydropiper*, and *Disma crenata*, are now, for the first time, added to the work.

INTRODUCTION.

WHEN we fix our attention upon a diversity of mixed objects, we naturally, and almost unconsciously, begin our inquiries by separating them into groups or families, according to their various analogies or resemblances. We thus obtain a general view of their common and partial relations; and are thereby better enabled to investigate their individual characters, as well as to retain what we have learned concerning them, by the influence of association. We become systematic from the very constitution of the human mind. To classify our ideas is the first step we take towards useful knowledge; and the highest attainments of intellect are but a more extensive and intimate view of the various relations which subsist between the objects of human knowledge.

As things are not viewed under the same aspect by every observer, and relations seen by some, which are either unimportant or unnoticed by others, it follows that arrangements founded on these views are exceedingly various and dissimilar. It is obvious, however, that the classification which includes the greatest number of the

conspicuous and constant relations of objects, must best answer the purposes of such arrangement. The difficulty lies in fixing upon the strongest, most constant, and universal points of resemblance, and to bring them together under such a scheme of arrangement as will exhibit them in the order of their most essential and conspicuous affinities. In arranging the objects of natural science, as, for instance, those of botany, zoology, or chemistry, we bring into view only those natural relations of conformation or character which subsist among the objects themselves. In medical science, however, we are obliged to enter upon a much more extensive and perplexing range of comparison. Here we must keep in view not only the relations of external agents with each other, but those also which they bear to *living* matter—to the effects which they produce upon the animal economy. The difficulties which arise from these complicated relations are particularly experienced in the classification of the materia medica; and hence the great imperfection and inadequacy of all the arrangements that have hitherto been proposed in this department of science. Some writers, strongly impressed with the insurmountable nature of these difficulties, have thought it best to reject all systematic arrangement, and to describe remedial substances in an alphabetical order. This simple mode of arrangement, it must be confessed, possesses advantages which cannot be obtained by more artificial classification. We are particularly enabled

thereby to exhibit a connected view of all the remedial qualities and therapeutic applications of each individual article, without the frequent repetitions so unavoidable under every other known system of classification. But to counterbalance this advantage, which, in reality, is of no *essential* importance, we lose sight, by the adoption of such an arrangement, of those general physiological and therapeutic relations between the living body and remedies, which, in themselves highly interesting, serve to give to this department of medicine the character of a science. A few have arranged the articles of the materia medica according to their chemical analogies alone. Burdach uses this mode of classification; but his system is exceedingly complicated and imperfect. Arrangements of the materia medica founded exclusively on the physical properties of medicine are even more objectionable, in every point of view, than the alphabetical order. Without throwing the least light on their therapeutic relations, they are necessarily very complex in their structure, and often bring articles together of the most opposite remedial properties. Cullen's arrangement, which is principally founded upon the general effects of medicinal agents, and partly, also, in its minor subdivisions, upon their physical relations, is still viewed by many, and I believe justly too, as the most perfect classification that has hitherto been offered upon this subject. But even this arrangement does not bring into view all those general analogies which subsist between the *effects*

of medicinal substances, and which may be used with peculiar propriety as the basis of classic distinctions. Observation teaches us, for instance, that certain remedies direct their action specifically upon certain organs or structures in the animal economy. These specific affinities between external agents and the various parts of the living body are fundamental and their notice is essential to a comprehensive and philosophical scheme of arrangement. Cullen, however, overlooked these particular views of the action of remedies, and founded his system on their ultimate medicinal effects alone. Thus the effect of opium in the living system is sleep. The medicine is, therefore, placed in the class of *narcotics*. This is well, so far as it goes. By this arrangement we at once know the *general character* of the effect; but we are not informed as to the particular organ or structure which is principally influenced, and by the peculiar excitement of which the more manifest *effects* are produced. If, however, we place the narcotics, as a genus, under the primary class of "*medicines whose action is specifically directed to the nervous system*," we exhibit at once a general view both of the character of the effect, and of the organ principally concerned with the medicine in its production. Alibert, who saw the propriety of attending to this latter object, adopted a classification founded *entirely* upon the relations which remedial agents bear to particular organs or structures, or, in other words, on their specific tendencies to affect

particular parts of the organization. His arrangement is, however, still more objectionable than that of Cullen. It exhibits, it is true, an interesting physiological view of the connections which subsist between medicinal agents and the various subordinate systems in the living economy; but it is deficient in the more useful *practical* distinctions derived from the ultimate effects of remedies, constituting the basis of Cullen's classification.

More recently, Dr. Granville, of England, has proposed a new classification of the materia medica, which combines, to a degree, the advantages both of Cullen's and Alibert's arrangements.* His primary or classic divisions are founded on the specific tendency of medicines to act upon particular organs, or systems of structure; and the old divisions of *tonics*, *cathartics*, &c., are introduced as secondary distinctions. This plan of arranging the materia medica appears to me to be superior to any that has hitherto been proposed. Dr. Granville has not, however, been altogether successful, I think, in the particular construction of his classification with regard to its minor divisions. He places stimulants, for instance, in the class of "*medicines that act specifically upon the digestive organs;*" whereas this genus undoubtedly belongs to his third class, which comprises those "medicines that act specifically on the circulating system." It may be said, however, that remedial agents of the stimulant class produce their effects upon the cir-

* Vide London Med. and Phys. Journal, for April, 1822.

culating system, by a specific action primarily exerted upon the stomach; and that the location given to these medicines by Dr. Granville is, therefore, proper. But although these remedies do certainly produce a primary excitement in the stomach, yet this primary impression is constantly and specifically directed upon the circulatory system, where it alone becomes obvious. It is this ultimate effect alone which we consider of consequence, or which can be regarded as a manifestation of the action of the stimulant. There are several other objections, of a similar character, which might be urged against the construction of this classification, although its general scheme is unquestionably very good. It forms the groundwork of the arrangement which I have adopted in this treatise, and of which, without any further comment, I subjoin the following synoptical view:

CLASSIFICATION OF THE MATERIA MEDICA.

A. Medicines that act specifically on the intestinal canal, or upon morbific matter lodged in it.
   I. Medicines that excite discharges from the alimentary canal.
      a. *Emetics.*
      b. *Cathartics.*
   II. Medicines calculated to destroy or counteract the influence of morbific substances lodged in the alimentary canal.
      a. *Anthelmintics.*
      b. *Antacids.*

B. Medicines whose action is principally directed to the muscular system.

I. Medicines calculated to correct certain morbid conditions of the system, by acting on the tonicity of the muscular fibre.

Tonics.

II. Medicines calculated to correct certain morbid states of the system, by acting on the contractility of the muscular fibre.

Astringents.

C. Medicines that act specifically on the uterine system.

I. Medicines calculated to promote the menstrual discharge.

Emmenagogues.

II. Medicines calculated to increase the parturient efforts of the womb.

Abortiva.

D. Medicines whose action is principally directed upon the nervous system.

I. Medicines that lessen the sensibility and irritability of the nervous system.

Narcotics.

II. Medicines that increase and equalize the nervous energy.

Antispasmodics.

E. Medicines whose action is principally manifested in the circulatory system.

I. Medicines that increase the action of the heart and arteries.

Stimulants.

F. Medicines acting specifically upon the organs of secretion.

I. Medicines that act on the cutaneous exhalents.

§. General.

a. *Diaphoretics.*

§. Topical.

b. *Epispastics.*

c. *Errhines.*

d. *Emollients.*

II. Medicines that increase the action of the urinary organs.

Diuretics.

III. Medicines that alter the state of the urinary secretion.

Antilithics.

IV. Medicines that promote the secretory action of the salivary glands.

Sialagogues.

G. Medicines that act specifically upon the respiratory organs.

I. Medicines calculated to increase the mucous secretion in the bronchia, and to promote its discharge.

a. *Expectorants.*

b. *Inhalations.*

II. Medicines whose action is purely topical.

a. *Emollients.*

b. *Escharotics.*

A TREATISE

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CHAPTER I.

Observations on the General Modus Operandi of Medicines.

The living economy is under the constant influence of extraneous agents, and subjected, by them, to an infinite variety of impressions. Concerning the essential nature of their action, however, it would be in vain to inquire. All the information attainable, in relation to their modus operandi, is confined, perhaps, to a knowledge of the organs upon which they primarily act; the medium through which their impressions are conveyed throughout the system, and the successive order of the phenomena which result from their operation.

The doctrines which prevail on this subject resolve themselves into the two following positions.

I. All medicines act primarily on the solids; their impressions being conveyed throughout the system by the agency of sympathy.

II. Medicines are absorbed into the circulation, and act on the system through the medium of the blood.

That the animal body possesses the faculty of transmitting impressions from one part to another, is an indisputable fact. Such a power is essential to the preservation of the living economy. The circle of vital actions would soon cease to revolve, were it not for some general connecting medium, by which the various

organs of the body are brought into a mutual harmony and correspondence of action. From an examination of the different structures of the animal system, and the functions which they perform, it is evident that the brain and its appendages—the nerves, constitute this medium of connection; for these alone receive and transmit impressions; and upon them, therefore, depend all those phenomena which are called *sympathetic.* The objection which has been made to this opinion, that sympathies exist between parts of the animal body that have no direct nervous communication with each other, is without foundation; for it must be obvious to every one, on a moment's reflection, that the nervous system brings every sentient and irritable part under the immediate influence of the *sensorium commune*, the brain; and that, therefore, all the parts of the body have a continuous nervous connection with each other, through the medium of this common centre of feeling. That sympathetic actions are thus propagated through the system, may be inferred from the known laws of nervous excitement. An impression made on the nervous extremities of a part, is either altogether local or insulated in its effects, or it is communicated to the sensorium commune, whence it is reflected either upon the part in which the primary irritation exists, producing sensation in that part; or upon other parts, exciting in them new motions and feelings.

The existence of sympathetic relations, and of their agency in propagating remedial impressions throughout the system, is, therefore, incontestable. It is, however, no less true, that many medicinal articles are absorbed into the circulation, and that they act on the animal economy through the medium of the blood.

It may not be improper to enter into a particular examination of the grounds upon which this opinion is founded, and of the objections that have been urged against it; more especially as it has of late years been warmly contested and rejected as "a relic of the humoral pathology."

Before entering more directly upon the proofs of the admission of remedial substances into the circulation in an undecomposed state, I shall make a few observations concerning the so common want of success in detecting, in the blood, certain substances received into the stomach, or otherwise subjected to the action of the absorbents. Dr. Wollaston states, that he gave a person three and a half grains of prussiate of potash repeated every hour to the third time. The urine being examined every half hour, was found, in two hours, to be tinged, and to afford a deep blue at the end of four hours. But in the serum of the blood which was *then* drawn no prussiate could be detected. This experiment is extremely fallacious. In the first place, it is to be observed that

probably but a small portion of the ten and a half grains of the prussiate received into the stomach was taken up by the lacteals. But this small portion could not have entered the circulation at once; it must have been introduced very gradually into the chyle; and as the kidneys, no doubt, commenced throwing it off, as soon as any part of it was present in the circulation, it is obvious that but a very minute quantity, indeed, could, at any particular time, have existed in the blood. It is, therefore, not to be wondered at, that he could not detect this substance in the serum of blood drawn after the greater part of that which had been absorbed had already appeared in the urine, and consequently passed out of the circulation; for the portion of the prussiate present in the blood, was not only very small, but diffused, moreover, through a mass of at least twenty-four pints of fluid. The urine, on the contrary, having gradually collected the prussiate, held in less, perhaps, than a pint, a much greater quantity of this substance than could have been present at any one time in the whole mass of the blood. Now from the experiments of Professor MACNEVEN, it appears that it requires one-eighth of a grain to two ounces of serum, before it can be detected by the most delicate tests.* It would, therefore, require more than ten grains of this substance in the blood, before it could be detected, supposing the serum to amount to about twelve pints. Hence, it is evident that no inference can be drawn from experiments of this kind, that can justly be regarded as militating against the opinions I am advocating. I have detected one-sixtieth of a grain of the prussiate in one ounce of urine; which accounts for the ease with which this substance is detected in this secretion, whilst in the serum it escapes our tests.

It may also be observed, that the articles usually employed in experiments of this kind, have a tendency very rapidly to pass off by the kidneys. It would seem that almost as soon as some of them arrive in the circulation they are again thrown off by the emunctories; and hence, although the urine may become highly charged with such substances, yet the blood, being so soon deprived of them again, shall contain but a very minute portion, diffused, too, through a large mass of fluid. Hence, also, we have an explanation of the fact, that certain substances, after having been received into the stomach, or injected into the cavity of the abdomen, may be detected in the mesenteric veins, vena portarum, splenic veins, and thoracic duct, whilst in the blood

* Experiments for ascertaining the permanency of chemical compounds in their passage through the fluids, in the New York Medical and Physical Journal, June, 1822.

generally no traces of their presence can be discovered. For, as many of the abdominal lymphatics open directly into the veins just mentioned, it is evident that the substances which these lymphatics absorb and convey into the veins in question, must be in a much less diluted state than they can be after becoming mixed with the general circulating mass. If we admit the existence of venous absorption, an opinion advocated by very high authority,* this explanation will be still more satisfactory.

Great, however, as are the difficulties connected with experiments of this kind, we are not without many well authenticated facts which prove the admission of foreign substances into the circulation. In the chyle of the thoracic duct, Musgrave, Lister, and Blumenbach detected substances which had been thrown into the intestines of animals. But not to dwell on the testimony offered upon this subject by the older writers, we are furnished with abundant evidence of this physiological fact by the researches of many of the most enlightened physiologists of the present day. The experiments of Mayer,† of Home,‡ of Magendie,§ and the more recent and satisfactory researches of Professors Tiedemann and Gmelin‖ leave no doubt on this point. The experiments of the two latter physiologists prove, in a direct and conclusive manner, that almost all the substances usually found in the urine, after having been taken into the stomach, may be detected also, by proper management, in the blood of the vena portæ, the splenic and mesenteric veins. These facts have been lately confirmed by an extensive course of experiments on this subject by Drs. Harlan, Coates and Lawrence of this city. From the interesting and well-digested report which these gentlemen have just published, it appears in positive evidence that camphor may, and does pass through the circulation. Having given a tabular view of sixteen experiments on living animals, they observe: "It is impossible to look over the above table without being struck with the obvious manner in which they indicate the route by which the chemical substance (prussiate of potassa), experimented on, entered the circulation. In nearly every instance in which *it was found in the blood*, the contents of the thoracic duct, if

* Magendie, Emmert.

† In Meckle's Archiv für die Physiologie.

‡ Philosoph. Trans. for 1811.

§ Précis Elémentaire de Physiologie.

‖ Versuche über die wege, auf welchen substanzen aus den magen und Darmcanal ins blut gelangen, u. s. w. Von F. Tiedemann, M. D., und L. Gmelin, M. D. Heidelberg, 1820.

examined, exhibited it in a much more obvious degree."* Still more recently, Professor Macneven, in the paper already quoted, has published the results of some experiments, which are entirely confirmatory of those just mentioned. "I triturated," says he, "one drachm of crystallized hydrocyanate of potassa with fresh butter and crumbs of bread, which being made into a bolus, the same dog swallowed and retained. Between three and four hours after, Dr. Anderson bled him largely from the jugular vein. A dose of hydrocyanic acid was then administered, of which he died without pain, and the abdomen was laid open. The lacteals and thoracic duct were seen well filled with milk-white chyle. On scratching the receptaculum, and pressing down on the duct, nearly half a teaspoonful of chyle was collected. Into this were let fall a couple of drops of the solution of permuriate of iron, and a deep blue was the immediate consequence." In another experiment of this kind Dr. Macneven found that, "whenever the mesenteric vessels of the external coats of the intestines were lightly scratched with the scalpel, and touched with the solution of permuriate of iron, a strong blue was immediately exhibited."

The facts which have already been detailed are, I think, quite conclusive on this point. It may not, however, be uninteresting to adduce a few other observations in evidence of the admission of foreign substances into the circulation. EMMERT, an eminent German physiologist, relates an experiment,† in which he passed a ligature round the abdominal aorta of an animal, and inserted the prussic acid into its legs. The extremities became cold, but some portion of contractility and sensibility remained. In seventy hours after its application the ligature was removed, and the effects of the poison immediately showed themselves. Similar experiments were performed with the poison *woorara*, by Mr. Brodie.‡ "He exposed the sciatic nerve of a rabbit in the upper and posterior part of the thigh, and passed under it a tape half an inch wide. He then made a wound in the leg, and having introduced into it some of the *woorara* mixed with water, he tied the tape moderately tight on the forepart of the thigh. He thus interrupted the communication between the wound and the other parts of the body by means of the vessels, while that by means of the nerves still remained. After the ligature was tightened, he applied the *woorara* a second time in another part of the leg. The rabbit was not affected, and at the end of an hour he re-

* Philadelphia Journal of the Medical and Physical Sciences, for Feb. 1822.

† Archiv für die Physiologie, Von I. F. Meckle.

‡ Philosophical Magazine, June, 1811.

moved the ligature. Being engaged in some other pursuits, he did not watch the animal so closely as he could otherwise have done, but twenty minutes after the ligature was removed, he found him lying on one side, motionless and insensible, evidently under the influence of the poison." It appears, therefore, that the poisons employed in these experiments were not able to affect the system until they had entered the general circulation. Brodie's researches render it, indeed, extremely probable that *woorara*, as well as several other poisons, produce their deleterious effects on the animal economy, by acting directly upon the brain through the medium of the blood, and that they are not injurious unless they are absorbed into the blood-vessels.

Besides the evidence of direct experiment, there are many other facts mentioned in the writings of physicians, which go to prove the absorption of foreign substances into the circulation. The effects of the internal use of nitrate of silver on the skin, strikingly illustrate this fact. A considerable number of cases have been related, on the most respectable authority, in which the skin acquired a very dark, and, in some instances, quite a black color, from the long-continued use of this medicine.* It is well known, too, that medicines taken by nurses very often produce the same effects upon their suckling infants, as if these had taken the medicine directly into their stomachs. It is a fact equally well known, that the milk of cows becomes imbued with the odor and taste of the vegetables on which they feed.

I am well aware that many deny that these facts can be regarded as evidence of the transmission of foreign substances into the circulation. It is said, for instance, that the process of digestion and assimilation completely decomposes all substances subjected to its influence; that, consequently, elementary particles only are admitted into the blood-vessels; and that these are recombined, and again rendered conspicuous when thrown into the secretions.

That substances taken into the stomach, or otherwise subjected to the action of the absorbents, are not necessarily decomposed before they are admitted into the circulation, is fully demonstrated by what has already been said.

Admitting, however, that the assimilating powers do decompose the substances subjected to their action, it does not, I think, form any valid objection to the doctrine alleging that the blood may become imbued with properties capable of producing remedial or morbific impressions, in consequence of disease or the admission of certain substances into the circulation. When the

* Lond. Med. Reposit., vol. v. May, 1817.

milk, urine, flesh, &c., become impregnated with the peculiar qualities of substances taken into the stomach, the blood, from which these secretions are formed, must have contained either the substances themselves, or their elements. It is evident, however, that blood which contains such elements, contains parts which do not belong to it in its natural and healthy state. Thus in the instance given above, in relation to the discoloration of the skin by the internal use of the nitrate of silver, if this substance were previously decomposed, and again regenerated in the skin, as has been alleged, we should then have silver, oxygen and azote floating each in a separate state in the blood, and without which no nitrate of silver could possibly be afterwards regenerated in the cutaneous vessels.

In opposition to the opinion that remedial substances enter the circulation in an active state, it is moreover asserted, in a late work on the Materia Medica, that "chyle, however diversified the materials may be out of which it is formed, whether animal or vegetable, has essentially an identity of nature." This assertion is entirely gratuitous, and contradicted by direct experiment. Dr. MARCET found that chyle formed from vegetable food contains nearly three times as much carbon as that which is formed from animal food; and that the chyle from animal substances, for the most part, enters into putrefaction in three or four days whilst that from vegetables remains unchanged for weeks, or even months. It appears, also, from these experiments, that chyle from animal food is milky, and on standing, becomes covered with a cream-like substance; whilst that from vegetable food is generally transparent, resembling common serum with a coagulum almost colorless, and does not collect a creamy substance on its surface.*

There is, therefore, a very striking difference between the chyle formed from animal and vegetable substances.

It has also been objected, "that it is incompatible with animal life that such active substances should be received into the circulation, since milk and other bland fluids have been known, when injected into the vessels, to occasion immediate death." It cannot be denied that substances *forced* into the circulation by a *syringe*, and of a reduced temperature, may, and in fact generally do occasion death. Such violent effects do not, however, always follow experiments of this kind. Drs. Smith, Wahrendorf, Borrichius, Magendie, and others, injected medicine into the veins of persons, and found them to produce the same effects as if they had been received into the stomach. Sir E. Home performed similar experiments, and demonstrated anew that remedial substances

* Medico-Chirurg. Transact., vol. vi. p. 630.

may be thus introduced into the system, not only without fatal consequences, but with the same effects as if they had been taken internally. The experiments of Dr. Smith and Sir E. Home are published in the Transactions of the Royal Society of London.

Although the introduction of foreign substances into the circulation by means of an injecting apparatus, often gives rise to dangerous or fatal consequences, it does not follow that the same violent effects must ensue from the introduction of the same articles into the blood, through the regular route of the absorbents. In the one case, the substance introduced is suddenly and forcibly urged into the blood-vessels; whereas, in the other, it passes into the veins, drop by drop, without any unnatural impetus, enveloped in bland and congenial fluids possessing the precise temperature of the blood. In confirmation of the correctness of this view, we need only advert to the fact, that chyle itself, when *injected* into the blood-vessels, will sometimes produce the same injurious effects that follow the introduction of other articles in the same way.

It has been said, also: "By the medication of the blood, were it possible, as is contended for, we must, in all instances, do harm. The whole mass of the circulating fluids is equally charged in this case with the medicinal substance, and therefore, while an action is going on in a diseased organ which may be salutary as to it, every sound part of the system becomes subjected to a similar impression, which could not fail to disturb the order of health, and create morbid derangements." To this hypothetical objection, I will oppose the observations of one of the editors of the New York Medical and Physical Journal. "That every organ in the body," says the writer, "has its peculiar and appropriate stimulus, by which it is excited into action, is so universally admitted as to require no process of reasoning to establish it. If this be so, then there can be but little difficulty, we think, in conceiving that a substance dissolved in the blood may circulate through the system, without producing any particular effects until it reaches the organ upon which, from its peculiar properties, it is designed to operate. The reason why a medicine acts upon one organ, in preference to all the other organs of the body—why jalap for instance, operates upon the intestines, and not upon the brain and lungs—we can no more explain than we can the reason why the planets are kept revolving in their orbits. If we are told that the movements of the planets are the result of attraction, so we may say that the determination of medicines to certain organs is occasioned by a similar attraction. This, however, explains nothing, and we must, after all, be content with the broad fact, that such phenomena do occur, and that they are governed by certain

laws; but the *cause why* they occur must for ever remain concealed."

From the foregoing observations, therefore, it is, I think, perfectly evident, that medicines may produce remedial impressions in both the ways mentioned in the beginning of this chapter. This, indeed, is the generally admitted doctrine on this subject, with those who have kept pace with the progress of medical science.

CHAPTER II.

A. MEDICINES THAT ACT SPECIFICALLY ON THE INTESTINAL CANAL, OR UPON MORBIFIC MATTERS LODGED IN IT.

I. *Medicines that excite Discharges from the Alimentary Canal.*

EMETICS.

An emetic is a substance which excites vomiting by a specific impression on the stomach, independent of mere distention from quantity, or of nauseous taste or smell.

With regard to the *mechanism* of vomiting, experiments, apparently equally correct and conclusive, have led to very opposite results. *Chirac*,* a French physician of the seventeenth century, published an account of some experiments he had performed on living animals, with the view of ascertaining the particular process of vomiting. The conclusions which he drew from his experiments are: that in the act of vomiting the stomach is quiescent, and that its contents are ejected solely by being forcibly compressed between the diaphragm and abdominal muscles. Magendie, without alluding to the experiments of *Chirac*, has drawn the same conclusions from a set of experiments he has lately performed on this subject. The experiments of Haighton, on the contrary, seem to prove, very conclusively, that vomiting is chiefly, if not entirely, effected by the contraction of the muscular coat of the stomach; and this is the opinion now almost universally entertained. There can, however, be but little doubt, that all the powers which have been mentioned, conspire to produce the act of vomiting. The stomach contracts; its peristaltic action is inverted; the diaphragm and abdominal muscles are brought into action, and thus, by the combined agency of all these powers, emesis is produced.

How do emetics excite the actions of the stomach and muscles

* Histoire de l'Académie Royale des Sciences, p. 12, an. 1700.

concerned in the process of vomiting? The speculations of Darwin on this subject, though, perhaps, untenable upon the whole, are not without considerable plausibility. He alleges that the excitement of the stomach is greatly diminished by the action of an emetic; in consequence of which its peristaltic motion becomes inverted. When nausea is produced, (says he,) the stomach, as well as the whole system, is in a state of temporary debility. As the nausea increases in intensity, the natural powers of the stomach are more and more diminished, until they cease altogether, and give rise to an inverted motion of its muscular fibres. In confirmation of this view of the subject, he refers to the vomiting produced by causes manifestly debilitating, such as syncope, concussion of the brain, &c.

It is impossible to ascertain the precise nature of the changes which take place in the living system from the operations of extraneous causes. All that we can hope to arrive at in this respect, is a knowledge of the general character and order of phenomena; a point, indeed, which it is but seldom allowed us to attain. When an agent is applied to the system, a longer or shorter train of actions takes place intermediately between its application and its ultimate or characteristic effect. In proportion as we trace the successive links in the chain of actions which proceed from the operation of a remedy, so do we succeed in obtaining a knowledge of the modus operandi. With regard to the operation of emetics, therefore, we may trace, I think, the following series of actions. The emetic, in the first place, makes an impression on the sentient extremities of the stomach. The impression is immediately referred to the sensorium commune; in consequence of which its natural energies are diminished, as is evinced by the languor of both the intellectual and corporeal powers. But as the sensation of an irritated organ depends, in reality, directly on a peculiar excitement in the sensorium commune, so we may infer that the sensation of nausea is the immediate and necessary result of the diminished and peculiar excitement of the brain, referred to the stomach. That this is, in fact, the case, is demonstrated by the vomiting and nausea which are sometimes excited at the sight, smell, taste, or even the thought of a disgusting object. Here, however, our progress is arrested. For we can trace no necessary connection between nausea and the mechanical process of vomiting. We know not why a certain degree of nausea produces contractions of the organs concerned in this act, any more than we know why a certain degree of venereal excitement calls into action the muscles concerned in *ejectione seminis*. These are mysteries, locked up in the bosom of our CREATOR, concerning which it would be idle to speculate.

When an emetic is taken, an uneasy sensation is first experienced, which is sooner or later followed by nausea; this gradually grows stronger and stronger, while the pulse becomes feeble, frequent, and irregular; the face turns pale, and the skin becomes cold and shrunk; vomiting finally comes on, during which the face is red and turgid with blood. On the cessation of the vomiting the sickness goes off, leaving the system in a state of temporary languor, from which it soon recovers.

Contrary to what takes place with the operation of other articles on the animal economy, emetics increase, by repetition, the susceptibility of the stomach to their impressions. Cullen states that he knew a person so accustomed to excite vomiting in himself, that the one-twentieth of a grain of tart. antim. was sufficient to cause a convulsive action of the stomach.

The evacuation produced by an emetic is not confined to the stomach, but extends occasionally also to the duodenum; and even further. During the act of vomiting, there must be considerable pressure exerted upon the liver and gall-bladder, by the contraction of the diaphragm and abdominal muscles. In consequence of this, a more copious discharge of bile into the duodenum takes place;* and this effect is promoted by the relaxation produced in the common duct by the previous nausea. Being thus more copiously thrown into the duodenum, during the first efforts of vomiting, the bile is readily conveyed to the stomach, both by the inverted motion of the intestine, and the pressure of the abdominal muscles. It is obvious from this, that, although the contents of the stomach may at first be thrown off free from any admixture of bile, yet after one or two acts of vomiting, by which the contents of the duodenum are forced into the stomach, this fluid may be copiously discharged. When, therefore, we do not observe any bile in the fluid thrown off, until several full evacuations have occurred, we may conclude that it did not previously exist in the stomach, but was brought into it by the preceding acts of vomiting.

In cholera, we generally find no bile in the discharges, until vomiting has continued for some time. In this case, the bile is probably furnished from the gall-bladder, which, being compressed by the action of the diaphragm and abdominal muscles, during vomiting, pours its contents into the intestines, and thence into the stomach. From this circumstance, we derive a caution against the imprudent repetition of vomits, on finding bile in each succeeding discharge, under the fallacious idea of expelling the whole of it from the primæ viæ.

* Cullen's Materia Medica.

Evacuation of the contents of the stomach is by no means the only remedial effect which may result from this class of medicinal agents. By agitating and compressing the contents of the abdominal viscera, vomiting gives an impulse to the portal circulation —an effect which, in certain diseases, connected with a sluggish and congested state of this system of blood-vessels, is often highly salutary. Emetics may, moreover, prove beneficial, by the general shock or excitement which they produce in the nervous system. It is by an influence of this kind, perhaps, that they are sometimes capable of arresting the progress of febrile affections when administered in their forming stage, while the morbid excitement is as yet principally confined to the nervous system.

The operation of emetics is generally attended with an *increased activity of the absorbents.* The experiments of Magendie have established the physiological fact, that the rapidity of absorption bears an inverse ratio to the fullness and activity of the sanguiferous system. When the blood-vessels are in a state of repletion or of vigorous action, absorption goes on very imperfectly; and, on the other hand, when the circulation is feeble, or the vessels in a state of depletion, the action of the absorbents is generally much increased. It is, doubtless, by an effect of this kind, namely, a reduction of the momentum of the circulation, that emetics increase the absorption of effused fluids. If this be the mode in which emetics increase absorption, it seems evident that those articles of this class of remedies which cause the greatest degree of nausea, must be most efficient in reducing hydropic accumulations; for it is chiefly by the nausea which emetics produce, that they occasion any obvious reduction of the momentum of the circulation. At the same time that absorption is thus increased by an enfeebled state of the circulation, the reduction of effused fluids may be further increased by diminished exhalations; for it seems reasonable to presume, that, when the action of the heart and arteries is materially diminished, exhalation, also, will suffer a corresponding decrease.

In prescribing emetics, attention should be paid to the following circumstances.

1. Unless an urgent necessity exists for the immediate evacuation of the contents of the stomach, emetics should be administered in under doses, repeated at short intervals, until the desired effect is produced. The susceptibility of the stomach to the impressions of emetics, varies very greatly in different individuals, or in the same individual at different times. A dose scarcely sufficient to excite nausea, in one person, or at one time, would produce hyperemesis in another, or in the same person at another time. By giving the emetic in small portions, repeated at suitable inter-

vals, we may, in a great measure, control its operations, and produce the desired degree of emesis.

2. In plethoric subjects—in such as are predisposed to apoplexy, particularly when signs of undue fullness of the vessels of the head exist—and, in general, where the momentum of the circulation is great, blood ought to be abstracted, previous to the administration of emetics. Without this precautionary measure, serious and even fatal accidents might result from the forcible propulsion of the blood into the brain, by the exertions attending the operation of an emetic. Apoplexy, palsy, and convulsions have thus been suddenly produced.

3. During the operation of an emetic, the patient should drink warm diluents, such as lukewarm water, chamomile tea, and weak infusion of eupatorium perfoliatum—more especially when the principal purpose is to procure the removal of offensive substances from the stomach.

4. The patient should be cautioned against taking cold water during or soon after the operation of the emetic. I have known two instances of speedy death produced by cramp of the stomach, in consequence of a draught of cold water immediately after the operation of a dose of tartar emetic.

5. For at least twenty-four hours after the operation of an emetic, the diet should be simple, unirritating, digestible, and moderate in quantity.

From the extensive influence of this class of remedies on the animal economy, it may be readily conceived, that their remedial application must be various and important. In a great number of diseases, indeed, they are indispensable at some period or other of their progress. I now, therefore, proceed to give a more particular detail of their practical application.

Emetics constitute a very important class of remedies in febrile diseases. In the treatment of typhus, when exhibited in the forming stage of the disease, they sometimes arrest its progress in a very prompt manner. "Antimonial emetics," says Dr. Armstrong, "have been very generally recommended in typhus fever, and, according to my observation, are serviceable when the fever is of the least complicated form, commonly producing an improvement in the condition of the skin, respiration, and pulse in particular; and perhaps, it is on the power which they possess of determining the blood to the surface, and of changing the morbid states of the circulation, that their efficacy depends."

In typhus pneumonica, I have derived much advantage from emetics. They appeared to be particularly serviceable where much distress and pain in the thorax, with signs of internal congestion, were present. In such cases they promoted expectora-

tion, and tended to re-establish the equilibrium of the circulation. They appeared, moreover, to render the system more susceptible to the operation of stimulants. "In the typhoid and typhus pneumonica," says Professor Potter, "that occasioned such lamentable mortality, of late years, throughout the United States, emetics, judiciously employed, were more beneficial than any other remedy. It was, indeed, a novel spectacle to those who were accustomed to unsheath the lancet in almost every thoracic affection, to behold a pneumonic fever; perhaps an hæmoptoe, removed by the incantation of a single emetic."

Emetics have also been recommended in the various forms of malignant fever. In the beginning of some fevers of this character, they may occasionally prove beneficial, though, as a general rule, they are of doubtful propriety, even in the earlier stages of such fevers; and in their advanced periods, for the most part, injurious. In fevers of this character there is always a very strong tendency to inflammatory irritation of the mucous membrane of the alimentary canal; and, in nearly all cases, such a state of irritation or phlogosis occurs in the advanced periods of the disease. It seems obvious, therefore, that emetics cannot be resorted to in fevers of this kind, without considerable risk of doing injury; for it cannot be doubted, that where there is a strong tendency to mucous inflammation of the stomach, the irritating impressions of an emetic must tend, very materially, to promote the supervention of this unfavourable condition. General experience, in fact, has decided against the employment of emetics in fevers of this character, except, perhaps, in the forming stage, at which period they may doubtless often be useful, by the shock and a new excitement which they give to the nervous system, and by obviating or removing internal visceral congestions.

In intermittents, vomits are a very common remedy. They, indeed, sometimes put a stop to the disease, without the employment of any other medicine. There exists some difference of opinion with regard to the importance of exhibiting emetics, as a preparative to tonic remedies. Judging from my own experience, I am led to believe that an emetic will, in general, render the subsequent employment of bark more certainly successful; and this seems to be in accordance with the sentiments of many of the best writers on this subject. Independent of the general impression which emetics produce on the system, and which, of itself, must aid in breaking through the chain of morbid associations, they appear to render the stomach more sensible to the impression of other remedies, and consequently to give them a greater chance of displaying their remedial powers.

In some of the exanthemata, emetics are often of essential ser-

vice. They are especially useful in the *early* stage of scarlatina, both in its simple and malignant forms. When aided by the warm bath, they tend to "free the system from the pressure of the plethora of the internal blood-vessels, so frequently observed in the commencement of this disease, and by thus equalizing the whole circulation, to render the future case most commonly mild and manageable."*

Emetics have also been strongly recommended in some varieties of Erysipelas. In the bilious erysipelas, which Desault regards as the common and genuine form of this disease, he trusted entirely to antimonial emetics. *Renauldin*, author of the article *Erysipèle*, in the *Dictionnaire des Sciences Médicales*, also adds his testimony in favor of the use of emetics in this affection. In general, however, emetics are improper in cases attended with dryness of the skin, much thirst, great heat of the epigastrium, and a high grade of fever. (*Cazenave.*) In cases attended with bitterness of the mouth, a yellow fur on the tongue, nausea, and a moderate temperature of the skin, they may generally be employed with considerable advantage.

In the first stages of measles and small-pox, attended with strong internal congestions, the operation of an emetic often proves decidedly beneficial. "In the beginning of measles," says Dr. Armstrong, "when the lungs have been exceedingly oppressed, and particularly when vomiting has been absent, I have often seen the most striking relief follow an antimonial emetic, which may fairly be ranked among the most efficacious remedies in pulmonic congestions."† They are particularly useful in cases where, from great internal venous congestions, the appearance of the rash is retarded. In cases of this kind—that is, where the temperature of the skin is moderate, the pulse weak, and the animal functions depressed, about the period when the eruption of the exanthema may be expected, the operation of an emetic will often speedily develop the arterial excitement, and bring the measly rash.

Emetics constitute an important auxiliary in the treatment of many of the phlegmasiæ. In puerperal fever they were at one time in high repute. Where there are nausea and bilious vomiting in the beginning of the disease, one or two gentle emetics may sometimes be employed with advantage. They cannot, however, under any circumstances, be relied on as a principal remedy in this dangerous affection, and may, I think, be always omitted

* Armstrong on Scarlet Fever, p. 35.

† Practical Observations on Scarlet Fever, Measles, and Pulmonary Consumption, p. 130.

with propriety, except in the very commencement of the disease, and where the indications for their employment just mentioned are present.

In the treatment of croup, emetics are of unquestionable advantage. They are, indeed, altogether indispensable in managing this formidable malady, and will often procure effectual relief without any other remedy. In slight attacks, vomits, assisted by the warm pediluvium, and the application of rubefacients to the throat, often suffice to put a speedy termination to the disease. But where the febrile symptoms run high, and the breathing is very difficult, bleeding is our sheet-anchor. Whenever, therefore, vomiting and the warm bath do not afford effectual and speedy relief, immediate recourse ought to be had to the lancet. The bleeding should be carried to the extent of producing a decided impression on the system. "In all the cases of croup," says Dr. Ferriar, "which I have seen, I have found it necessary to bleed immediately, and when I have seen the patients sufficiently early to entertain hopes of saving them, I have directed the evacuation to be continued, so as to nearly produce fainting. This is the essential point of the cure, without which no relief can be effected. Even if the patient should not be seen till the day succeeding the attack, it is proper to bleed *ad deliquium*, if the subject be plethoric, and the difficulty of breathing and restlessness be great."* Independent of the relaxation which a decisive bleeding produces in the glottis, and the favorable impression it makes on the tracheal inflammation, it has the effect, also, of greatly facilitating the operation of emetics, by removing the cerebral congestion, and consequent insensibility of the stomach to the action of remedies. The emetics should be continued at intervals until the disease is completely subdued. In the latter stages of the complaint, they are useful by promoting the discharge of the viscid mucus secreted in the bronchia.

In cynanche laryngea, undoubtedly the most fatal variety of anginose disease, vomits have been known to afford decided benefit. Dr. Armstrong recommends the employment of emetics in this fatal affection, as one of the most effectual means we possess of arresting its progress. He states, that in five cases of this disease, he exhibited "tartarized antimony sometimes combined with ipecacuanha, in repeated doses, until free and frequent vomiting took place. No circumstance of my professional life," he continues, "ever gratified me more than the great and sudden relief which the vomiting afforded; in reality it removed all the

* Ferriar's Medical Histories and Reflections, p. 137. Philadelphia edition, 1816.

urgent symptoms at the time, and being excited as soon as ever the slightest signs of stricture in the larynx returned, at last completed the recovery."*

Emetics may be very beneficially employed in the treatment of peripneumonia notha. Where the inflammatory condition has been in some degree subdued, or where the stage of excitement has never developed itself fully from internal venous congestions, emetics, in repeated but gentle doses, are among our most efficient remedies. Large quantities of viscid phlegm are usually thrown up, and in many instances immediate relief is obtained. After the operation of the emetic, suitable stimulants, such as small doses of opium and camphor, with some gentle diaphoretic drinks, should be given.† Of course, blisters to the chest are never to be neglected. They are indispensable to relieve the local pulmonary affection.

Emetics are no less useful in the treatment of pneumonia biliosa, than in the preceding variety of pulmonic inflammation. *Richter*‡ says that they will often remove the excruciating pain in the thorax, as by enchantment. *Stoll*§ also speaks in the highest terms of the utility of emetics in this form of pleurisy. Professor Potter, of Baltimore, in an interesting paper published in the Medical Recorder, adds his testimony in favor of this practice. "Experience has taught us," says he, "that they (emetics) are eminently useful after the violence of inflammatory action shall have been abated, as well as in all the milder degrees with which this disease so frequently commences."‖ Since the first edition of this work was published, I have met with cases of strongly marked bilious pneumonia; and in these emetics afforded unequivocal benefit.

In the treatment of some varieties of acute ophthalmia, vomits have been recommended as particularly serviceable.

Many respectable writers have spoken very favorably of the powers of emetics in the cure of acute rheumatism. Horn¶ states, that in his hands emetics were more useful in this disease than any other remedy. He repeated them every day, until from fifteen to twenty were taken. The result of this practice, he informs

* Armstrong's Practical Illustrations on Typhus Fever. First American edition, p. 336.

† Richter's Specielle Therapie, vol. i. p. 427.

‡ Ibid., vol. i. p. 404.

§ Ratio Medend., vol. i.

‖ American Medical Recorder, vol. iv. p. 418.

¶ Uber die heils. wirk. der Brechmittel in hitzigen rheumat D. Archiv., b. viii. st. 2.

us, was exceeding happy. There is a form of rheumatism which occurs in low and marshy situations, and which Richter calls *rheumatismus acutus gastricus*, depending, according to Stoll, on an irritation from vitiated or redundant bile in the primæ viæ.* In this form of the disease emetics are generally decidedly beneficial. Lentin† speaks of rheumatism connected with a bilious form of fever, in which vomits produced very beneficial effects. Scudamore also speaks favorably of the employment of vomits in this disease. "If the patient be seized," says he, "in consequence of exposure, shortly after some convivial occasion, on which he has indulged in improper diet, the present remedy should not, on any account, be neglected."‡ I have occasionally met with cases of acute rheumatism, attended with manifest bilious symptoms, and in these I have employed emetics with advantage. In the purely inflammatory form of this disease, modified by marsh miasmata, I have, however, never resorted to emetics, and can, therefore, say nothing from my own experience of their value in such cases.

Emetics have also been strongly recommended in gout. Scudamore thinks that they should not be used, "unless an evacuation of the stomach in a full degree is obviously indicated." He mentions a case, however, in which the good effects of an emetic were strongly exemplified. Mr. Alexander Small, surgeon at Minorca, speaks very favorably of the efficacy of tart. antim. in his own case of gout. He sometimes gave it with bark, in which combination it acted as a mild aperient.§

Mr. Saunders‖ was in the habit of employing tartarized antimony so as to excite nausea, or full vomiting, in acute ophthalmia, with great success. In that variety of inflammation of the eyes, called Egyptian ophthalmia, Sir W. Adams speaks of the use of emetics in the strongest terms of praise.

In gutta serena, also, emetics have been administered with very considerable advantage. Richter, who considered the cause of this disease as seated in the abdominal viscera, employed them much in conjunction with the deobstruent pills which will be hereafter mentioned under the head of Antispasmodics.¶

* Ratio Med., tom. ii. p. 25.

† De aere et morb. clausthal., p. 30.

‡ A Treatise on the Nature and Cure of Gout and Rheumatism, p. 298.

§ Observations on the Gout, by A. Small, late surgeon to the ordnance in the island of Minorca, in the Med. Observ. and Inquiries, vol. vi. p. 198.

‖ A Treatise on some Practical Points relating to Diseases of the Eye, by I C. Saunders.

¶ Richter's Medical and Surgical Observations, p. 254.

Of the propriety of employing emetics in hemoptysis, I have great doubts, although very respectable testimony in favor of this practice may be adduced. When we attend to what takes place during the operation of an emetic, it is difficult, I apprehend, to enter upon the employment of vomits for the cure of this variety of hemorrhage, as recommended by Dr. Bryan Robinson, without considerable fears as to the result. During the process of vomiting there is a strong impulse given to the circulation; a full inspiration is made by which the lungs become expanded, and a greater facility given to the escape of blood from the bleeding orifice.* Besides these effects, there is undoubtedly some impediment created to the passage of the blood through the abdominal aorta, in consequence of the action of the abdominal muscles and diaphragm; and of course there will be a greater impetus given to the blood through the superior arteries. It is true, that both before and after the act of vomiting, a very considerable languor in the circulation occurs, which might favor the suppression of the hemorrhage; and if these remedies be exhibited only to the extent of inducing nausea, there can be no doubt of their being, in some degree, advantageous. The agitation and straining, however, during the efforts of vomiting, are calculated to produce much more mischief than could be compensated by any advantage to be derived from the subsequent languor. Cullen, indeed, who tried this practice, states that in one instance it increased the hemorrhage to a great and alarming degree.

In hemorrhages from the uterus, there are, I think, much better grounds for expecting useful effects from the operation of this class of remedies.

Independent of very respectable testimony in favor of the use of emetics in this variety of hemorrhage, we have a good anatomical reason, both for the advantages of vomits in menorrhagia, and for their occasional injurious effect in hemoptysis. During the act of vomiting, the abdominal muscles and diaphragm are thrown into a state of violent contraction. The natural consequence of this is a degree of pressure on the abdominal aorta, both where it passes through the crura of the diaphragm, by the contraction of this muscle, and in its course through the abdomen, by being compressed in common with the other contents of this cavity. Hence there will be a slight impediment to the passage of the blood to the lower portions of the body, whilst it will be more forcibly driven into the vessels which pass off from the aorta within the thorax. The reason is, therefore, obvious why vomiting will sometimes not only increase, but give rise to an

* An Essay on the Materia Med., by J. Moore, p. 320.

hemorrhage from the lungs; whilst, on the contrary, its effects in menorrhagia, so far as experience has taught us, are not only free from dangerous consequences, but are very often of unquestionable service.

The only case in which I have had recourse to this practice, was recently, in a delicate female, who, with menorrhagia, suffered under symptoms indicating the use of a gentle emetic. I ordered her eighteen grains of ipecacuanha, which brought on several copious bilious discharges from the stomach; and had the effect, besides, of giving a very decided check to the hemorrhage.

Emetics have, also, been particularly recommended for the cure of hæmatemesis. Dr. Sheridan states that, in a considerable number of instances of this variety of hemorrhage, he has obtained decided benefit from emetics; and Dr. Chapman has resorted to this practice with unequivocal advantage.

In the treatment of dysentery, emetics are often of very great advantage. Where there is a redundancy of vitiated bile present in the primæ viæ, as is frequently the case in the dysenteries of hot climates and marshy districts, vomits would seem to be indispensable. Sir John Pringle speaks very favorably of this practice; and Mr. T. Clark assures us that he derived the greatest advantage from the employment of emetics in this disease, when administered in the form of enemata.* Cleghorn, too, gives his testimony in favor of emetics in this disease.† In cases unattended with high febrile excitement, I have sometimes given an ipecacuanha puke, when first called to the patient, and I believe always with advantage. It is evident, however, that where there is much fever, emetics should not be used until the arterial excitement is adequately reduced by direct depletory measures. In the treatment of diarrhœa, also, this class of remedies will often prove very serviceable. In this and the former intestinal disease, vomits are useful, not so much by evacuating the contents of the stomach, as by their tendency to equalize the circulation, and to determine it to the surface.

In that species of mania which arises from the intemperate use of ardent spirits, emetics are sometimes decidedly efficacious. This practice was introduced a few years ago, by Dr. Joseph Klapp, of this city, who has published the result‡ of his very ex-

* Observations on the Nature and Cure of the Diseases of the East and West Indies.

† Cleghorn's Observat. on the Epidem. of Minorca, p. 146.

‡ Vide Eclec. Repertory, vol. vii. p. 251. Also American Medical Recorder, vols. ii. and iii.

tensive experience on this subject, exhibiting strong evidence of the utility of emetics in this very singular variety of mania. The late Dr. Albers, of Bremen, in a letter written a short time before his death, gave me an account of three cases of this disease, in which emetics were employed with evident advantage. The result was such, at least, as to induce him to express a determination to adopt a similar treatment in future.

The stomach, in this disease, is often extremely insensible to the operation of emetics. It is, therefore, in general, necessary to employ very large doses before vomiting can be excited. Where full emesis is produced, the mental hallucinations are commonly much corrected, and in mild cases, sometimes entirely suspended, by a single emetic. It will most frequently be necessary, however, to repeat the emetic two, three, four or even five or six times, at such intervals as the particular circumstances of the case may require. In the course of this treatment, the bowels must be kept relaxed by aperients, if the emetics do not produce this effect. Dr. Klapp does not think it necessary or even proper, to employ opium along with the emetic treatment, unless extreme exhaustion or hypercatharsis be induced by the emetic.

Emetics have also been much recommended in other varieties of mania, and in hypochondriasis. In the latter complaint I have employed them with evident advantage. An enemic will often rouse the hypochondriac patient from that state of mental and physical torpor with which he is pressed down, and render his system more sensible to the operation of other remedies. Emetics are particularly advantageous in this disease, when alternated with alterative doses of blue pill, and an occasional saline purgative. Whatever be our notions concerning the pathology of hypochondriasis, observation has fully demonstrated the intimate connection of its symptoms with the particular condition of the abdominal viscera. In this disease there generally exists much congestion in the portal vessels, with torpor and functional derangement of the liver. By the employment of these remedies, therefore, we not only evacuate the alimentary canal of its vitiated contents, but also invigorate the circulation in the portal system, both by the mechanical agitation of the vomiting, and the specific influence of the mercury upon the vascular extremities of the hepatic system. In a case of puerperal mania, I derived the most decided benefit from the employment of emetics. The patient had been delivered of her first child four days, when she began to manifest symptoms of mental derangement. She would neither speak nor take nourishment, unless greatly urged. After using a variety of means to induce her to speak, she replied that she was talking to good spirits from the other world, and was

determined to have nothing to do with the beings of this wicked place. She declared she was perfectly well, and stood in no need of any medicines. In this state she continued for three days, and then, all at once, became extremely loquacious. Her pulse was small and frequent, and the pupils of her eyes much contracted. Under these circumstances, I ordered her an antimonial emetic, which brought on pretty copious vomiting. She became evidently much tranquilized by its operation, and seemed, at short intervals, to be sensible of her real situation. On the evening after the vomiting, I gave her an anodyne draught, which, however, did not procure her the rest I anticipated. On the next day I gave her another emetic, which again operated well; and from this period she rapidly recovered the full possession of her mental faculties.

In hysteria, also, emetics are often of unequivocal advantage. They are, perhaps, to be employed usefully in every variety of the disease; but in that form which is attended with complete suspension of the animal functions, or a state resembling syncope, I have found them to be particularly useful.* Dr. Dean, a highly respectable practitioner in the interior of this state, adds his testimony in favor of the employment of emetics in hysteric affections. His experience has led him to regard them as decidedly the most effectual remedy we possess in the chronic form of this disease. "It is in the chronic variety of this complaint," says Dr. Dean, "in which the common routine of what are improperly termed antispasmodic medicines, produce no other than transient relief to the patient, that I have experienced the most permanent good effects from the administration of emetics. In cases of this description, where the patients had labored under this disease for ten years, and during that time, 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 diseased action in the stomach, that antispasmodic and tonic medicines would, in general, complete the cure."† Dr. Joseph Smith, of New York, has published some interesting observations on the employment of emetics in spasmodic diseases. "The experience I have had," says he, "of the utility of emetics in *hysteria* and epilepsy, enables me to assert, with confidence, that they are more efficacious than any remedy ordinarily employed."‡

* American Medical Recorder, vol. iv. p. 124.

† Ibid., p. 259.

‡ Transactions of the New York Physico-Medical Society, vol. i.

In asthma emetics are sometimes highly useful. They not only assist materially in expelling the viscid mucus from the bronchia, but operate in a direct manner in facilitating the transmission of the blood from the right to the left side of the heart, the impeded course of which forms perhaps the chief source of distress in this and other similar affections. That the operation of an emetic produces this effect, is evident from the circumstances which take place during the act of vomiting. During this process, the diaphragm is drawn downwards, by which the thoracic cavity is enlarged, and the lungs are in a full state of inspiration, and therefore expanded to the utmost degree. The necessary consequence of this is, that the blood which had congested in the pulmonary arteries, right side of the heart and large venous trunks, in consequence of the previous inadequate expansion of the lungs, is now, during the act of vomiting, permitted to pass on with freedom to the right side of the heart. And hence, in part, the temporary relief almost invariably obtained from full vomiting in this disease.

In the treatment of hooping-cough, also, emetics in general afford very considerable relief. Where the disease is attended with much arterial excitement, they are, however, inadequate of themselves to do much good, and should be assisted by prompt and decisive venesection.

Much dispute existed at one time concerning the propriety of administering emetics in apoplexy. This subject is amply and warmly discussed in the fifth and sixth volumes of the London Medical and Physical Journal. As the tendency of vomiting to propel the blood to the superior parts of the body, from the causes which I have already mentioned in this chapter, is very considerable, I am entirely convinced that, in general, this class of remedies cannot be safely employed in apoplexy. This disease may, however, occur under circumstances of gastric irritation, which will not only render the employment of an emetic useful, but absolutely indispensable. When, for instance, apoplexy comes on immediately after eating a full meal, it would be exceedingly unwise to suffer the stomach to remain oppressed and over-distended by what had been eaten. But even under such circumstances, a copious abstraction of blood should always be premised, for the apoplectic symptoms may as yet depend simply on turgescence of the vessels of the brain, which, from the further impetus given to the blood by the efforts of vomiting, may become ruptured, and bring on fatal extravasation. The occurrence of this event will be rendered much less probable, if we lessen, to a considerable degree, the general mass of the blood previous to administering the emetic. Where there is no strong reason to suspect irritation in the stomach, either from over-distension or

from the presence of some irritating substance, I cannot conceive what advantage could result from the administration of an emetic. If apoplexy be essentially connected with engorgement of the cerebral vessels, it is obviously wrong to resort to a treatment which has a direct tendency to increase the fullness of these vessels.

Of the effects of emetics in epilepsy, the records of medicine furnish us with very contradictory evidence. As in the treatment of apoplexy, so in that of epilepsy, their employment has been on the one hand as extravagantly praised, as it has been inordinately censured on the other. It may be observed that, perhaps, in all cases where we have contradictory evidence, from respectable sources, in relation to the remedial powers of a remedy, it arises from its having been given either in different stages of the same complaint, or in different varieties dependent on a difference in the remote causes. We may therefore safely conclude, that although, as a general rule, emetics may not be proper in epilepsy, yet occasionally this disease may present itself under circumstances which will render them decidedly beneficial.

In the epilepsy of children, when there does not appear to be much fullness of the vessels of the head, and symptoms of gastric irritation are present, such as nausea, flatulency, disturbed sleep, and other marks of indigestion, emetics are sometimes of essential importance. Dr. J. Clark advises, for this purpose, a solution of the sulphate of zinc in an aqueous infusion of ipecacuanha, to be repeated in six, eight, or ten days, according to circumstances. Dr. Thomas says, that when an attack of idiopathic epilepsy can be foreseen, there is, perhaps, no remedy which will be more likely to prevent the paroxysm than an emetic administered about an hour before its accession. In a child, which had been about eighteen months affected with occasional epileptic convulsions, I succeeded in removing the disease entirely, by a long course of emetic remedies, administered every third day. The disease came on after an attack of ague, which was cured by arsenic, and was probably at least kept up from habit. I employed ipecacuanha.

Of the utility of emetics in the early stages of indigestion there can be no doubt. In the advanced periods of the complaint, however, when the disease no longer consists simply in *functional* derangement of the stomach, but has degenerated into chronic inflammatory irritation of its mucous membrane, they are decidedly improper. In recent attacks of indigestion, attended with distressing pains of the stomach, or symptoms of an oppressed state of the brain, an emetic will often procure the most prompt relief. In persons whose digestive organs are much debilitated, food, which in the healthy state of the stomach is perfectly innocent and nutritious, will sometimes produce "great general distress,

numbness of the scalp, violent colic, acute pain in the side and bladder, vertigo, apoplexy, and convulsions." In affections of this kind, emetics are obviously the proper remedies; Dr. Revere, of Baltimore, relates several cases in which their efficacy was promptly and conspicuously manifested.*

But although an occasional vomit may be useful or even indispensable, in obviating the ordinary symptoms of indigestion, yet experience has shown the propriety of employing them with caution; and only when evident symptoms of gastric impurities are present.

In dropsical diseases emetics have been much employed. They have been prescribed in every variety of dropsy, but they appear to be more particularly applicable to the treatment of *anasarca* and *ascites*.

Emetics have also been recommended in diabetes. Richter relates several cases that were effectually cured by them. Where this disease is evidently connected with gastric irritation, as in the cases mentioned by Richter, vomits will, no doubt, do much good. This writer mentions an instance of this disease, where an emetic brought up a very great quantity of bilious matter; "and I can assert with truth," says he, "that next morning there was not a vestige of diabetes or of any other complaint present."† We have also the testimony of Frank in favor of the employment of this class of remedies in the present disease. Emetics are, indeed, a very common remedy in the treatment of diabetes with the German physicians; and many cases may be found in their writings illustrative of their beneficial effects.

In the treatment of jaundice, emetics are often of essential service. They are particularly calculated to promote the passage of gall-stones through the common duct. By the nausea they create, they relax the duct, whilst the mechanical pressure and agitation caused by vomiting tend to push the calculus forward in the relaxed tube.

Emetics often act very beneficially in hernia humoralis. I have, in several instances, witnessed the good effects of strong antimonial vomits in reducing these painful swellings. Emetics have also been a good deal recommended to reduce indolent buboes; but their effects in this way do not appear to be considerable.

For obstinate constipation, emetics have been very highly recommended. The Greek and Roman physicians appear to have frequently resorted to this practice. It is recommended by Hip-

* American Medical Recorder, vol. iv. p. 50.

† Medical and Surgical Observations, p. 84.

pocrates,* Paraxagoras,† Cœlius Aurelianus,‡ Alexander Tralianus;§ and among the moderns, by Stoll,‖ Sims,¶ Sumeire,** and Deplace.†† Quite recently Professor Hosack has published his experience upon this subject. He details seven cases of this kind, from which it appears, "that in the commencement of constipation, or in its more advanced stage, when the symptoms of inflammation have been subdued by the lancet, emetics may be very advantageously exhibited, both for the purpose of removing the hepatic obstructions, and of counteracting the spasmodic constriction and pain ordinarily attendant upon this disease."‡‡

CEPHÆLIS IPECACUANHA.

(*Ipecacuanhæ Radix.*)

This plant—a native of South America—was first discovered about the middle of the seventeenth century. Its botanical character remained for a long time unknown. It was, at first, thought to be a species of viola—the *viola ipecacuanha* of Linnæus. That celebrated botanist afterwards obtained some specimens of a plant from Mutis, which, it was thought, afforded the genuine ipecacuanha. This plant he described under the name of *poycotria emetica*, and it was, accordingly, for some time, generally regarded as the true ipecacuanha. More careful observations, however, discovered that neither of these two plants was the one which afforded the genuine root. It was not until the year 1801 that the actual plant which yields the ipecacuanha was described. Dr. Gomez, of Lisbon, was the first who gave an accurate description and figure of it; and in the following year, M. Brotero, Professor of Botany at the University of Coimbra, published a full account of it under the name of *callicocca ipecacuanha*. But as "the term *callicocca* had been applied by Schreber, without sufficient reason, to a genus previously established and named, it

* Περι Νουσων. III. v. Opp. p. 491.
† Apud Cœl. Aurel., p. 243.
‡ Ibid., pp. 529–532.
§ L. iii. c. 44.
‖ Rat. Med., pt. ii. pp. 135–138.
¶ Observations, p. 20, *et seq.*
** Journal de Médecine, t. lxi. p. 369.
†† Ledellot. Jour., t. xxxvi.
‡‡ New York Medical and Physical Journal, vol. i. No. 1, p. 60.

has, of late years, been universally abandoned for the *cephælis* of Swartz."

There can be no doubt, however, that the ipecacuanha of commerce often consists of different roots, possessing emetic properties, and bearing a general resemblance to each other. Decandolle asserts that the ipecacuanha, as it is found in the shops, is frequently a mixture of the genuine root with the roots of some species of violets, opocynæ, euphorbia, &c.; and appears, moreover, to be occasionally mixed with the roots of some species of the genus *Ionidum*.* To what degree these adulterations may deteriorate the value of the ipecacuanha, I am unable to say. It is certain, however, that they must interfere with its peculiar virtues, and tend more or less to modify and render uncertain its effects.

The genuine ipecacuanha is in irregularly bent or contorted pieces, about the thickness of a goose-quill, consisting of an internal firm ligneous portion, of a light straw color, and a thick layer of cortical substance, presenting on its surface numerous annular ridges, or prominent rings, separated by deep and narrow fissures. The external, or cortical portion, is a compact horny structure, slightly diaphanous, breaking with a resinous fracture, and easily separated from the internal ligneous cord. The epidermis, or external surface of the root, varies considerably in color. In some specimens it is of a deep brown or blackish color; other specimens present a reddish-brown, or reddish-gray surface, and we sometimes find it gray, or ash-colored. The diversity of color does not indicate any essential difference in the roots, or in their medicinal or chemical properties, and depends, probably, "on difference in age, or place of growth, or mode of drying." The internal woody part is nearly inert, the peculiar medicinal virtues of the root residing almost wholly in the external cortical substance. The color of the powder is of a light grayish fawn. In its aggregate state, the root has but very little smell, but when pulverized, it emits a peculiar nauseous odor, which, in some individuals, causes extremely unpleasant effects, such as giddiness, fainting, asthma, &c. Its taste is bitter, acrid, and very nauseous.

Magendie and Pelletier have ascertained that ipecacuanha contains a peculiar principle, to which they have given the name of *emetin*,† and upon which the emetic properties of the root

* Nouveaux Elemens de Thérapeutique, par I. L. Alibert, t. i.

† The following is the formula introduced into the new codex of Paris, for the preparation of this substance:—"Let ℥i of the powder of ipecacuanha be macerated in ℥ii of ether, with a gentle heat, for some hours, in a distil-

seem entirely to depend. This substance resides almost exclusively in the cortical part of the root.

When perfectly pure, it consists of a white pulverulent substance, possessing a slightly bitter, and somewhat nauseous taste, but little or no odor. It undergoes no change when exposed to the air; is very fusible, sparingly soluble in cold water and ether, but readily dissolved by alcohol. It unites with the mineral acids, and with acetic acid, and forms crystalizable salts. Gallic acid precipitates it from its solutions; "it is very difficult, however, to procure it in a state of entire purity;" and as it is obtained in the shops it is always very impure. *Impure* emetic consists of minute transparent scales, of a brownish red color, possessing very little odor, and a taste resembling that of the powdered ipecacuanha. It is rapidly dissolved by water, acetic acid, and alcohol, but insoluble in ether. It deliquesces in moist air, and is precipitated from its solutions by gallic acid, the acetates of lead, and corrosive sublimate, but tartarized antimony has no effect on it. According to the analysis of Pelletier, ipecacuanha contains sixteen parts of emetin, two of oil, six of wax, ten of gum, forty of starch, and twenty of woody fibre.

Of a hundred parts of ipecacuanha, alcohol takes up about twenty-one; proof spirits somewhat more than thirty-two; and boiling water nearly forty-seven.

This substance is, undoubtedly, the most important vegetable emetic we possess, and in many instances preferable to every other article belonging to this class. It is mild in its operation, and may be safely exhibited under circumstances of general exhaustion, or intestinal irritation, which would render the employment of antimonial emetics injurious. In all cases where the stomach is irritable or debilitated, the ipecacuanha is decidedly the best emetic. It seems to have less tendency to weaken the digestive powers of the stomach than any other article of this class; it would appear even to exert some tonic power upon this organ, when given in very minute doses, as I have more than once observed in my own person, and it unites, moreover, to its

ling apparatus; let the portion which remains be triturated and boiled with ℥iv of alcohol, it having been previously macerated in it; filter, and let the remainder be treated with fresh portions of alcohol, as long as anything is taken up from the root; mix these alcoholic solutions and evaporate to dryness; let this alcohol extract be macerated in cold distilled water, in order that everything soluble in that menstruum may be dissolved; filter, and evaporate to dryness; this extract is *emetine;* in this state, however, it contains a small quantity of *gallic acid*, but which is too inconsiderable to effect its medicinal qualities."—*Paris's Pharmacologia.*

emetic virtues, no inconsiderable powers as an antispasmodic, as well as a tendency to allay nervous irritation. It possesses another advantage over antimonial emetics, which in many cases is of great importance; it is much less apt to act upon the bowels, and to pass off by copious and exhausting stools, than the preparations of antimony. This is of immense consequence in many diseases; for we often find it useful to procure emesis, in cases where a rapid catharsis would prove highly injurious. It is, nevertheless, not destitute of properties capable of exciting the peristaltic action of the intestines. It will, in general, after having acted upon the stomach, prove gently aperient, and excite, moreover, in a very particular manner, the cutaneous exhalents;—circumstances which render it peculiarly adapted to the treatment of several intestinal diseases.

Its power as an anti-dysenteric, was indeed the very first circumstance which brought this remedy into notice. Pison, as early as 1649, mentioned the ipecacuanha as a common remedy for dysentery in the Brazils. It was not, however, until the year 1672 that it became known in Europe. When first imported into France, it was, for some years, employed as a secret remedy, by John Helvetius, grandfather of the celebrated metaphysical author of that name. His success with this remedy, in the treatment of dysentery and diarrhœa, was so great as to attract general attention, and induce Louis XIV. to grant him a large sum of money, besides public honors, for making the remedy public. Although this article has not maintained its former reputation as a remedy in dysenteric affections, it is, nevertheless, still regarded, and justly too, as a medicine of much value in complaints of this kind. It is given in dysentery, with a view either to its emetic or sudorific operation, though the latter is in general the principal intention for which it is employed. On this account, therefore, it is commonly given in combination with other substances calculated to increase its tendency to excite the cutaneous emunctories. Besides these obvious effects on the system, ipecacuanha appears, moreover, to possess the power of tranquilizing the actions of the alimentary canal, *when administered in minute doses.* I have, in many instances, known chronic vomiting and diarrhœa arrested by repeated doses of minute portions of this article, although no perceptible evacuant effect attended its operation.

Mosely, who adopted the sudorific plan of treating this disease, gave small doses of ipecacuanha in combination with opium. There can be no doubt that this treatment may sometimes cure dysentery, but the experience of the profession would seem to show that it cannot be safely relied on as a principal part of the

treatment of such cases. In the dysenteries of this country, at least, more promptly evacuant measures are necessary, and if ipecacuanha be used in the early stage, it should, perhaps, always be given, in the first place, to the extent of inducing full vomiting. Sir John Pringle was in the habit of giving it in small doses, and repeating it until both vomiting and purging were produced. To insure its operation on the bowels, Cleghorn gave it in union with the *cerated glass of antimony*, in such doses as to produce a full emeto-cathartic effect.

In the latter stages of the complaint, however, when the arterial excitement has been considerably subdued, there is no remedy which is so well calculated to mitigate at once the distressing tormina, and to keep up an agreeable and salutary moisture of the surface, as ipecacuanha and opium combined. If calomel be united with these two articles, we heighten still more the curative effects of the composition; for, in connection with the torpor of the cutaneous exhalents, the functions of the liver are always more or less deranged in this malady.

Mr. Playfair, in a paper published in the tenth volume of the Edinburgh Medical and Surgical Journal, has given an account of a new mode of using ipecacuanha in this disease; and which he states to have proved exceedingly successful. He gave from half a drachm to a drachm of the article, in union with from thirty to sixty drops of laudanum, keeping the patient for some time after in a horizontal position. When the medicine was rejected he repeated the dose. He states that this practice is applicable only to the early stage of the disease. He practiced in Bengal. The ipecacuanha has also been administered in the form of an enema, in dysentery; and its effects, when thus employed, have been much praised.* For this purpose, three drachms of the bruised root are to be boiled in a quart of water down to a pint and administered, all at once, as an enema. This injection is also greatly extolled for the relief it affords internal piles. In several cases of this kind, I have, myself, had an opportunity of witnessing its good effects.

Ipecacuanha, given in small doses, so as to puke gently, has been much praised for its effects in the cure of diarrhœa, and more particularly if the disease be attended with symptoms of gastric impurities. Dr. Samuel Pye has published a number of cases illustrative of the good effects of ipecacuanha in this disease. He administered it in small doses, sufficient, however, to produce vomiting, and repeated the medicine from day to day, with an

* Observations on Fevers and other Diseases of the Indies. By Thomas Clark. London, 1801.

occasional anodyne mixture, until the disease disappeared.* The same practice is recommended, for the cure of diarrhœa, by Dr. Fothergill, and my own experience enables me to speak with much confidence of the usefulness of the practice, in cases of this kind.

Much has been said of the efficacy of nauseating doses of ipecacuanha in hemorrhages. Dr. A. N. Aasheim, a Danish physician, has published some interesting observations on the employment of this remedy in hemoptysis. He gave one-fourth of a grain every three hours during the day, and every four hours during the night. The third dose, in general, excited slight vomiting. By this treatment, Aasheim remarks, the bleeding was put a stop to; the cough became less severe, and the skin, which before was dry, was rendered moist and soft to the feel.† Richter observes, that when hemoptysis is attended with cold extremities, anxiety, restlessness, pale urine, and a small, tense and quick pulse, great advantage may, in general, be derived from quarter of a grain doses of ipecacuanha repeated every fifteen minutes;‡ and Meza asserts, that under circumstances of this kind, it is the most effectual of all remedies when given in this way.§ The good effects of this article in hemorrhage depend, no doubt, on the restraint which it exercises over the action of the heart and arteries, by the nausea it creates, and still more, perhaps, on its power of equalizing the circulation and exciting the cutaneous emunctories. In uterine hemorrhage, this article has been found still more beneficial than in the other hemorrhages, and this may, perhaps, be accounted for in the way I have already attempted to do, when speaking of the general application of this class of remedies to the cure of diseases. It was first particularly recommended as a remedy in menorrhagia, by Dahlberg;‖ and its efficacy was afterwards confirmed by Plink, Loeffler, and others. Bergius relates a violent case of uterine hemorrhage, which he cured by giving half a grain of this remedy every half hour. I have never used the ipecacuanha in cases of this kind, but I can well conceive of the propriety of the practice.

Ipecacuanha vomits have been thought peculiarly serviceable in asthma. Bang, Percival, and Joerdens mention its use in this affection with particular commendation. Vomiting, by whatever

* Medical Observations and Inquiries, vol. i. p. 2.

† Alibert, Mat. Med., tom. i. p. 248.

‡ Speciell Therapie.

§ Samml. Auserles. Abhand., Bd. 15, p. 259.

‖ Specielle Arzneimittellehre. Von G. A. Richter. Berlin, 1827.

article excited, must of itself, simply from its mechanical operation, be useful in the asthmatic paroxysm. By the contraction of the diaphragm, it augments the cavity of the thorax, and allows the lungs to expand more fully, by which the transmission of blood through those organs is greatly facilitated, and a principal source of uneasiness in this disease temporarily removed. Besides this effect, it aids, in no inconsiderable degree, to expel the viscid mucus from the bronchia, and thereby gives a greater opportunity for the oxygenation of the blood. But independent of these general effects, ipecacuanha has been supposed to possess antispasmodic or other peculiar powers calculated to act beneficially in this disease. It may be doubted, however, whether, in this respect, it possesses any advantages over other emetics, except in its acting more mildly, and not being apt, like the antimonial preparations, to pass off rapidly by the bowels, and debilitate the digestive organs. It must be observed, however, that Akenside, who published a paper on the use of this article in the present disease,* states that he found it equally useful, whether given to the extent of producing vomiting, or only in nauseating doses. In the *paroxysm* he administered it so as to produce vomiting, but after the paroxysm had passed off, he continued its use every morning in nauseating portions.

In the Memoirs of the Medical Society of Copenhagen, there are some very interesting remarks on the employment of ipecacuanha as an *anti-emetic*, by Dr. Schonheyder. He relates the history of a case of *ileus*, in which small doses of this article proved successful, after every other means of relief had been fruitlessly employed. In this case the stomach was extremely irritable, and fecal matter was thrown up, very frequently, for several days. The thirst was extremely urgent; the abdomen, however, was neither hard, nor tumid, nor painful. Small doses of ipecacuanha were finally given. The second dose removed the disposition to vomit; and by continuing the medicine, the disease was entirely subdued.† Burdach also states that it is very useful in habitual vomiting from morbid irritability of the stomach. In such cases, however, it must be given in very small doses.

Of the efficacy of minute doses of ipecacuanha, in cases of this kind, I have recently had an interesting exemplification. An hospital patient, who had for three weeks labored under such extreme irritability of the stomach, that almost everything he took into his stomach was speedily rejected, after a great variety

* Memoirs of the London College of Physicians.

† Alibert, Matière Médicale, t. i. p. 249.

of means had been resorted to, without any decided advantage, was, in a short time, entirely relieved by quarter-grain doses of ipecacuanha every half hour.

Alibert mentions, on the authority of J. W. Guldbrand, a Swedish physician, that ipecacuanha has been found to manifest important emmenagogue powers. He refers to two obstinate cases of amenorrhœa effectually cured by it.

Ipecacuanha has also been applied to the cure of indigestion. Daubenton gave it in doses just sufficient "to excite a slight sensation of vermicular motion of the stomach, without carrying it to the point of nausea."* I have used it in my own case, in doses of one-fourth of a grain every morning, noon and evening, with evident advantage. Hufeland recommends the use of one-fourth of a grain every two hours, in cases of indigestion, attended with much flatulence, tension, and fullness in the epigastrium, together with constipation and a sense of fullness in the head.†

With regard to the proper dose of this article, we should find it difficult to arrive at any definite conclusion, from a reference to authorities. Dr. Pye records upwards of one hundred and fifty cases, in all of which vomiting was produced effectually, and in by far the greatest majority repeatedly, by two, three, and four grain doses. Cullen expresses his doubts with regard to the correctness of this statement; but we have the testimony of Chaumenton and others in confirmation of the vomitive power of small doses. Those who are in the habit of prescribing the Dover's powder, or the more simple combination of ipecacuanha and opium, for diaphoretic purposes, know how apt they are to excite vomiting, although the quantity of ipecacuanha is but very small. It would appear, indeed, as if the opium which enters into these compositions, enhanced the emetic properties of the ipecacuanha. The medium dose of powdered ipecacuanha, as an emetic, is about twenty grains; although much larger doses may be given without detriment, as the greater part of it is commonly thrown up by the first discharges. I am informed by Dr. Joseph Hartshorne, of this city, that the addition of powdered gum Arabic destroys almost entirely the peculiar nauseous taste of ipecacuanha. The officinal preparations are the *pulvis ipecacuanhæ compositus*, and the *vinum ipecacuanha*. The powder becomes inert by long exposure to the air and light. All vegetable astringents, as *infusion of galls*, &c., *vegetable acids*, especially the *acetic*, weaken its power. Dr. Irvine found that gr. xxx, administered in ʒii of vinegar, produced only some loose stools.

Emetin is a powerful preparation of ipecacuanha. One-sixth part of it is considered equivalent to about one part of the pow-

* Alibert. † Hufeland's Journal, Bd. 29. St. xi. p. 121.

dered root. It is apt to produce very active vomiting, but its tendency to create irritation of the mucous membrane of the stomach and bowels appears to be very considerable, and renders it altogether a much less useful medicine than the ipecacuanha in substance. Ten grains of this preparation were sufficient to destroy animals in twenty-four hours; and on dissection the mucous membrane of the whole tract of the alimentary canal, as well as the respiratory passages, exhibited marks of strong irritation. It is said also to manifest narcotic powers. When given so as to excite vomiting, it generally leaves the patient in a very drowsy disposition.

Formulæ.

℞.—Pulv. ipecac. gr. x;
Pulv. opii gr. v;
Calomel gr. v;
Pulv. camph. gr. viii.—M. Divide into ten equal parts. One of these, taken every two or three hours, will often procure much relief in dysentery, after proper evacuations have been produced.

℞.—Pulv. nitrat. potas. ʒi;
Calomel gr. vi;
P. opii gr. iii;
P. ipecac. gr. vi.—M. Divide into six equal parts. One to be taken every two hours. This combination is an excellent expectorant in pulmonary catarrh.

℞.—Pulv. ipecac. gr. viii;
Massæ hydrarg. gr. xxiv;
Pulv. capsici gr. vi.—M. Divide into six pills. One to be taken at night, as an alterative, in indigestion from mere debility of the stomach.

ANTIMONY.

ANTIMONY is a hard and brittle metal of a bluish-white color, resembling tin in its lustre. It is of a lamellated texture, and when handled, imparts a peculiar smell to the fingers. It enters into fusion at a degree of heat a little above red, and when suffered to cool, presents a stellated appearance on the surface.

This substance was known to the ancients under the name of *stibium*, but was not employed as an internal remedy until about the middle of the sixteenth century. About this period Basil Valentinus published his *Currus Triumphalis*, in which we find various preparations of this metal mentioned, and their internal employment enthusiastically recommended.

Paracelsus became its warm advocate, and announced it as a

powerful and efficacious remedy in plague. In the plague which ravaged Bohemia in 1562, antimony was extensively employed. But as its virtues were imperfectly understood, it was frequently administered improperly, and occasionally attended with violent and dangerous consequences.* It was, therefore, soon denounced by the Medical Faculty of Paris as a fatal poison; in consequence of which the French Parliament issued a severe decree against its internal employment in 1566. In 1603, the celebrated Theodore Turquet de Mayerne was prosecuted for having sold antimonial preparations, contrary to the decree of Parliament; and Besnir, an eminent physician of that time, was expelled the Medical Faculty of Paris, for having employed this proscribed remedy. After this decree had been suffered to stand for more than half a century, it was at last repealed, and antimony soon became one of the most boasted and popular articles of the materia medica.

In pursuit of an universal remedy, the alchemists of the sixteenth and seventeenth centuries subjected this metal to an infinite variety of chemical processes, from which has resulted an astonishing number of preparations, differing, however, more in the degree than in the quality of their remedial powers.

The pure metallic antimony is entirely insoluble in water and alcohol. Vegetable acids act upon it, though but feebly; and hence cups of this metal were formerly employed to impart an emetic quality to wine.

Crude Antimony.—Sulphuret of Antimony.—The article met with in the shops under this name is a protosulphuret of the metal, and is obtained from the native sulphuret by different modes of purification. It consists of one equivalent of antimony, 44, and one equivalent of sulphur, 16·60. In this state of combination, antimony is at present but very rarely employed in medicine, and never as an emetic. As an alterative, however, it has been much praised by some writers of eminence; and it is not improbable that, in some cutaneous, and other chronic disorders, its powers are too much neglected. In the Transactions of the Society of Copenhagen, Dr. J. W. Guldbrand has published a paper on the anti-arthritic virtues of crude antimony, and he declares it to be a most valuable remedy in chronic rheumatism. Quarin gave it in this disease, in combination with three parts of sulphur; and Stoll, who speaks highly of its employment in affections of this kind, recommends it to be used in union with myrrh. One of the general effects of antimonial remedies, when given in minute doses, appears to be, an excitation of the capillary vessels throughout the whole system, but more especially of those

* Matthiol. Comment. in Dioscorid., lib. v. c. 59, p. 838.

of the cutaneous surface. Such an operation has a direct tendency, not only to equalize the general circulation, and to remove congestions in the capillary system, but also to excite a new action in the extreme vessels of the skin, and consequently to relieve those disorders of the cutaneous surface which depend on deranged functions of its vessels. Antimony is, indeed, one of the most important remedies we possess, in the treatment of many of the diseases of the skin. In the crude state it has been much employed for this purpose, both by itself and in union with other substances, such as cicuta, guaiac, dulcamara, &c. It is, notwithstanding, confessedly inferior, in this respect, to the more active preparations of the metal. In the treatment of *plica polonica*, Lafontaine regards it as almost an invaluable remedy.*

In scrofulous affections the sulphuret of antimony is much extolled by some writers. It appears to be particularly applicable to cases that are attended with cutaneous eruptions, or ulcerations. Richter cured a case of scrofulous fistula lachrymalia by means of the internal employment of the sulphuret of antimony. Kotrum recommends it in union with equal portions of burned sponge, sulphur, cicuta, and pulverized oyster-shell, as a valuable remedy for goitre.

This substance is given in finely levigated powder, in the dose of from ten to thirty grains. If it act as an emetic, in consequence of meeting with an acid in the stomach, it ought to be given in combination with an alkali or absorbent.

Antimonii Sulphuretum Præcipitatum.—This is a bright orange-colored, slightly styptic, inodorous powder. It is composed of about thirty parts of sulphur, fifty-five of sub-oxide of antimony, and fifteen of sulphuretted hydrogen. It is entirely insoluble in water. When exposed to heat, it readily enters into combustion, burning with a greenish-blue flame, giving off sulphureous acid vapor, and leaving the metal in the state of a gray oxide. Sulphuric acid does not act upon it when pure; if it effervesces with this acid, as is sometimes the case, we may presume that it is adulterated with chalk. In a state of purity, it dissolves readily in solutions of the caustic fixed alkalies.

This preparation is diaphoretic, cathartic, or emetic, according to the dose in which it is exhibited. In the cure of cutaneous diseases, this medicine was formerly more generally recommended than any other antimonial preparation. It has unquestionably considerable claims to attention in this respect, although upon the whole, perhaps, is less efficacious in these affections than the black sulphuret of antimony already noticed. In eruptions depending on a syphilitic taint, it may be very advantageously em-

* Burdach's Mat. Med., vol. ii. p. 376.

ployed in combination with mercury. For this purpose I have been much in the habit of prescribing Plummer's pill,* which is, indeed, a very useful remedy in almost every variety of chronic disease of the skin.

The precipitated sulphuret of antimony has been recommended as peculiarly serviceable in chronic rheumatism. In this disease it is given in union with camphor, opium, or gum guaiac.†

The dose of this preparation is from two to six grains, three or four times daily. It is to be gradually augmented until it excites slight nausea, and ought never to be given with acid or acidulous salts, if it be employed with a view to its alterative effects, as these substances have the power of very considerably increasing its emetic properties. Where there is reason to suspect the existence of an acid in the primæ viæ, it ought to be administered in union with soap, magnesia, or aromatic confection.‡

Kermes Mineral. Oxy-sulphuret of Antimony.—This preparation was formerly thought to consist of a combination of sulphuretted hydrogen and protoxide of antimony. According to Gay Lussac's analysis, however, it is a compound of the sulphuret and protoxide of antimony. Berzelius regards it as a union of sulphuret of antimony and a small portion of sulphuret of potassium; but the view taken of its chemical nature by Gay Lussac is now generally adopted as the most correct. When properly prepared, this article is in the form of a dark brown powder, acquiring a much lighter tint when exposed, for some time, to the air. With the assistance of heat, muriatic acid decomposes it readily and completely, disengaging hydro-sulphuric acid.

Kermes mineral was first employed as a medicinal agent in France, in the early part of the last century. Its preparation and composition were for some years kept a secret by a surgeon named La Ligerie; but its remedial virtues were so highly esteemed as to induce the French government, in 1720, to purchase the recipe for the benefit of the public.

The effects of this preparation do not appear to differ materially from those produced by the *precipitated sulphuret* mentioned under the preceding head. The French and German

* ℞.—Calomel,
Antim. sulph. præcipit, āā ʒii;
Pulv. guaiac. ʒiv;
Sapo. venet. ʒiii;
M. F. pil., āā gr. iii. Take from two to four, morning and evening.

† Burdach's Mat. Med., vol. ii. p. 407. Phil. Conrad. Fabricius, Diss. de Sulphuris Antimonii Aurant: eximio usu in Arthritide. Helmot, 1759.

‡ Paris's Pharmacologia.

physicians employ it frequently in acute catarrhal and pneumonic affections, where the expectoration is scanty. I have myself often used it, in complaints of this kind, and sometimes with evident advantage. It is given in doses of from a half to two grains, with a view to its diaphoretic and expectorant effects.

Antimonium Tartarizatum. Antimonii et potassæ tartras. Tartar Emetic.—This is, in all respects, decidedly the most important antimonial preparation. It consists of a combination of the tartrate of potassa with the tartrate of antimony—the principle of its formation "being merely the saturation of the excess of acid in the bitartrate of potassa (cream of tartar) with protoxide of antimony."* It is composed of two equivalents of tartaric acid, one of potassa, three of protoxide of antimony, and two of water.

Tartarized antimony is a white, inodorous salt, of a peculiar acrid and nauseous taste, crystalizing in tetrahedral prisms when prepared, according to the directions of the Dublin and United States Pharmacopœias, from the nitro-muriatic oxide of antimony. When prepared from the sulphuret, or from the glass of antimony, the salt crystalizes in rhombic octohedrons. When exposed to the air, these crystals slightly effloresce on the surface, and lose their diaphanous appearance. They are wholly insoluble in alcohol; but cold water dissolves about one-fourteenth part of its weight, and boiling water one-half its weight of the salt. Upon this point, however, the experience of different observers varies considerably. Thus, according to Dr. Duncan, boiling water dissolves only one-third its weight of tartar emetic; and Dr. Percival asserts that it dissolves in twelve times its weight of cold water. The watery solution of tartar emetic reddens litmus, and gradually "undergoes spontaneous decomposition by keeping." The mineral acids, added to a solution of this salt, render it turbid; and the alkalies and their carbonates decompose it, and precipitate the antimony in the state of a protoxide. Many of the metallic salts and oxides also decompose it, particularly the acetate and sub-acetate of lead; and the same effect is produced by soaps, lime-water, muriate of lime, and hydro-sulphuric acid and its compounds. The infusions and decoctions, also, of many bitter and astringent vegetables, more especially the Peruvian bark, galls, rhubarb, oak-bark, and catechu, decompose this salt. An ounce of the decoction of yellow bark is said to be capable of decomposing twenty grains of tartar emetic, and of course rendering it almost wholly inert. It is manifest, therefore, that the exhibition of tartarized antimony, in combination or in concomitance with

* Paris's Pharmacologia; from which work chiefly I have taken the chemical and pharmaceutical character of this salt.

any of these substances, must, in a great degree, defeat the purpose for which this preparation may be administered. The alkaline sulphates, if perfectly neutral, do not affect this salt. When, however, "there is an excess of acid, as in alum and bisulphate of potassa, &c., then its decomposition is effected, and a white insoluble sulphate of antimony is precipitated." "It appears, therefore," adds Dr. Paris, "that the famous 'emeto-purgative' of the French school, consisting of sulphate of soda and tartarized antimony, in solution, is by no means the unchemical mixture which some have considered it to be, and that it really produces its effects from the operation of its original ingredients, and not from that of the compounds (*sulphate of antimony, tartrate of soda, and sulphate of potassa*) which have been erroneously supposed to result."

The effects of tartar emetic on the living economy are various, according to the dose administered. Given in very minute doses, as one-sixteenth or one-twelfth of a grain, it increases pulmonary secretion, and promotes expectoration. Exhibited in the dose of one-quarter or one-third of a grain, it augments the cutaneous transpiration, as well as the secretion of urine. In the dose of one-half to one grain, it increases the secretion of the saliva, the gastric and intestinal mucus, and occasions nausea and alvine discharges. In a still stronger dose, from two to four grains, it speedily excites nausea, and full and perfect emesis. If it be given in an over-dose, it produces inflammation of the stomach and bowels. Magendie states that he found the mucous coat of the digestive and pulmonary organs of those who had died of excessive doses of this substance, to exhibit marks of inflammation.* It also affects the nervous system, producing vertigo, anxiety, insensibility and delirium. Brodie thinks that tartrate of antimony acts directly on the brain. In some experiments he performed with this substance on living animals, he saw paralysis, insensibility, and torpor produced, unattended by any other effects to which these symptoms could be ascribed as secondary results.† Its most important operation, however, independent of its emetic effects, is the sedative influence which it exerts on the animal

* De l'Influence de l'Emétique sur l'Homme et les Animaux. Paris, 1815, 8vo.

† Orfila gives the following general symptoms of poisoning by tartar emetic. "Rough metallic taste, nausea, copious vomitings, frequent hiccup, cardialgia, burning heat in the epigastrium, pains of the stomach, colic, inflation, copious stools, syncope, small contracted and accelerated pulse, cold skin, sometimes intense heat, difficult breathing, vertigo, loss of sense, convulsive movements, painful cramps in the legs, prostration of strength, death." To these symptoms difficulty of swallowing is sometimes joined.

economy. The control which it exercises over the action of the heart is sometimes so great as to produce syncope, and even death. Brodie, after having given large doses of this salt to animals, found, on opening them, that the heart beat exceedingly feeble, and although artificial respiration was kept up, it soon ceased to act.

As a vomit, tartar emetic is the most important article we possess. Its effects are certain, prompt, and energetic. It occasions more complete agitation, and a stronger impression upon the whole nervous system, than ipecacuanha; and is not apt, like this latter substance, to leave the bowels in a constipated state. It acts, also, with great certainty in producing diaphoresis; and finally, it operates in smaller doses, and is less disagreeable to the taste.

Tartarized antimony, either as an emetic, or as a means of curbing the action of the heart and arteries, or of inducing diaphoresis, is one of the most useful remedies in febrile diseases. Cullen, who was particularly fond of prescribing this article in fevers, thought that its good effects in this respect depended mainly on the *nausea* which it produces when given in minute doses. This opinion is, however, controverted by Fordyce, and more recently by Balfour, Lanthois, and others. It is contended by these writers, that this medicine is most efficacious in fevers, when it produces little or no sensible effects on the stomach. The two latter writers, especially, bring forward strong evidence of its possessing sedative powers, independent of its diaphoretic or nauseating effects. The experiments of Brodie, already mentioned, are also in evidence of the correctness of this opinion.

Upon this subject Dr. Chapman observes, "Emetics seem to do good in the cure of fever, by exciting their *own* specific or peculiar action, and when they disorder the stomach by sickness, they depart from this, and, if they do not act as poisons, always become *nugatory*, or more or less *mischievous*."

That tartar emetic has a tendency to lessen febrile excitement, independent of its nauseating effect, is unquestionable; yet the declaration that the *nausea* which it creates renders its anti-febrile effects "nugatory or mischievous," is wholly unsupported by experience. All that can be correctly said upon this point is, that the good effects of this remedy in acute diseases, are not confined to *nauseating doses;* just as the anti-syphilitic powers of mercury are not confined to its salivating effects.

The idea that tartar emetic "departs from its specific or peculiar action when it creates *nausea*," is to me altogether incomprehensible. *Nausea* is but an intermediate link in the chain of effects produced by this remedy; and to say that its peculiar operation ceases when this effect supervenes, appears to me to carry

with it its own contradiction, and certainly is without the shadow of a proof. We might, with just as much propriety, assert that when mercury produces ptyalism, it departs from its peculiar or specific action, and becomes "nugatory or mischievous."

It appears to be beyond a doubt, that tartar emetic has a specific power of moderating the action of the heart and arteries; and upon this power, doubtless, its good effects in acute diseases mainly depend. Although this effect of the remedy, namely, the reduction of arterial excitement, may take place, independent of *nausea*, yet there are no facts which can lead us to believe that it *ceases* when nausea comes on. Everything, on the contrary, clearly demonstrates that when nausea does supervene, the action of the sanguiferous system is still more prostrated. From what I have observed of the operation of antimonials in the cure of fevers, I am of opinion that its good effects will be most decidedly manifested, when it is given in doses just sufficient to create and sustain very *slight* nausea.

Much of the advantage of this, as perhaps of all other remedies, depends, I conceive, on keeping up an equable impression upon the system. If the degree of the action be greatly varied, irregular and fluctuating determinations must take place in the body. For it must be observed, that, in proportion as the action of a remedy rises in degree, so does it sucessively bring under its more especial influence particular organs of the general system; and hence, if its impressions fluctuate in intensity, there will be a corresponding fluctuation in the excitement of the organs upon which the peculiar powers of the remedy determine it to act. Thus a dose of tartarized antimony acts first upon the nerves and brain, whose influence, according to the experiments of Brodie, it diminishes. As a necessary consequence of this, the capillaries, being more immediately under the nervous influence, fall into a corresponding state of relaxation, and give rise to a freer discharge of the perspiratory fluid. If the action of the remedy rise still higher in intensity, it brings under its influence the stomach, giving rise to the sensation of *nausea;* this effect being the result of a greater degree of sedative operation than the preceding ones, is attended with an augmented relaxation of the cutaneous capillaries, and consequently with a more profuse discharge of perspiration. A still higher degree of the influence of the remedy directs its action more especially upon the muscular fibres of the stomach, diaphragm, and upon the abdominal muscles, all of which it brings into violent and simultaneous contraction. From all this it is evident that, by frequently varying the degree of action of our remedy, we keep up an irregular fluctuation of the excitement of the organs which it affects, a circumstance which I conceive must interfere very considerably with its salutary operation.

It is upon this principle, therefore, that I would object to the employment of *nauseating* doses of antimonial remedies, and not upon the supposition that their febrifuge effects are incompatible with their nauseating operation. In order to obtain the full advantages of these remedies, their action must be kept up for a considerable time. But it is often extremely difficult to keep up a *nausea* for any length of time, in consequence of its distressing effects upon the patient. It is, therefore, not frequently sustained with uniformity, and generally often interrupted. Hence we have its chief action at one time concentrated upon the stomach and cutaneous capillaries, and again suddenly withdrawn from these, and directed almost exclusively upon other parts. These disadvantages are avoided by exhibiting the remedy in doses insufficient to excite nausea; since, in such under-doses, its effects are confined exclusively to the nervous and sanguiferous systems, whose action it moderates without producing any fluctuations in the excitement of particular organs. If, in prescribing antimonials, we can keep up a continued and uninterrupted nausea for an adequate length of time, we should, I am persuaded, obtain the full advantages of the remedy. But as there is a difficulty in effecting this, it will, I think, be best either never to carry it to the point of producing nausea, or perhaps, as I have already said, just far enough to excite this sensation in a very slight degree. This may be further illustrated by the effects which mercury produces on the system. Thus while we keep up a uniform ptyalism, we fully obtain the sanative effects of this substance, in perhaps as short a period as possible. If, however, it becomes frequently interrupted, and again renewed, we derive much less benefit from it than we do either from a course of continued salivation, or from one in which the mercury is never carried to the extent of producing this effect.

I conceive, therefore, that the antiphlogistic operation of the antimonial preparations depends mainly upon *their sedative effects;* first, on the nervous system, and consecutively on the heart and arteries; and that these effects will be the more advantageous as they are more equably diffused throughout the whole system.

The sedative or contra-stimulant operation of tartar emetic has, indeed, of late years been incontestably established by Tommasini and Rasori. So powerful are its effects in this respect, that it may, it is said, be advantageously substituted for venesection in phlegmasial affections. I have, myself, seen a few instances in which the extraordinary sedative operation of this article in *large doses* was strikingly illustrated. It appears, from the observations that have been published on this subject in Italy and in France, that in febrile and inflammatory diseases the stomach will generally bear

large doses of tartar emetic without being excited to nausea or vomiting. Dr. Fontaneilles of Milan, asserts that the power of the system to sustain large doses of this article, without emesis, depends almost entirely on the system being in an inflammatory excitement; for in health, or after a febrile disease is partly subdued, the ability of taking large doses of this antimonial, without nausea or vomiting, does not exist.*

Dr. Balfour, in a late work on the sedative effects of tartar emetic, speaks in the highest terms of small doses of this remedy in febrile affections. "Tartar emetic," he says, "is eminently efficacious in chronic as well as acute disorders; in topical affections as well as in general derangement; and its efficacy in either case is not confined to *nauseating* doses. From its natural and powerful tendency to equalize the nervous power, it cannot fail, even where blood-letting is necessary in the first instance, to supersede the necessity of recurring to it so often, and carrying it to that degree which is found necessary when the lancet alone is trusted to, for the removal of inflammatory complaints."†

M. Lanthois, of Montpellier, has lately published a work, in which he adduces strong testimony in favor of the salutary operation of very minute doses of this remedy in phthisis pulmonalis. His mode of employing it is as follows: a grain of tartar emetic is to be dissolved in eight tablespoonfuls of distilled water. This is to be mixed with six or eight pints of water, but never more than twelve, nor less than six. "This is to be used for drink, either alone or with other drink, at meals, or with wine at all seasons and hours, and without any limited time, it being attended with no inconvenience."

In the treatment of some of the phlegmasial diseases, much reliance is placed on the sedative effects of this preparation by many eminent physicians of the present day. In Italy it has, in a great measure, taken the place of blood-letting in inflammatory diseases, and its decided and prompt antiphlogistic tendency, when given in strong doses, has been verified by the experience of a number of eminent physicians in France and Germany. In all phlegmasial affections, except those of the mucous membrane of the alimentary canal, this preparation has been found eminently useful. The general and local inflammatory action is frequently promptly and decisively redressed by its sedative operation. It has been found particularly beneficial in *pneumonia*, in which it is usually given by the advocates of the Italian doctrine, to the extent of from a scruple to several drachms in the course of twenty-four hours. M. Laennec speaks decidedly in favor of large doses of

* Archives Générales, Feb. 1824.

† Observations Illustrative of the Sedative Effects of Emetic Tartar, pp. 8–12.

tartar emetic in pneumonic affections; and he asserts, that when these diseases are treated by bleeding chiefly, the pulmonary engorgement continues much longer than in cases that have been treated by large doses of tartar emetic. Given to the extent of from twelve to twenty grains during the day, this article, he says, acts specifically in subduing inflammation, and powerfully promotes absorption. It appears from the observations of M. Fontaneilles, that the power of bearing large doses of tartar emetic without much nausea and vomiting, varies in different stages of the disease. It is the greatest, he says, at the acme, and decreases in proportion as the disease disappears. He generally gives about twelve grains per day in the first stage; when it has arrived at its acme, from a scruple to half a drachm is given during the same period. If the medicine produces active vomiting, the dose must be diminished.

For the reduction of enlarged and indurated spleen, so common after protracted intermittents, tartar emetic, taken in small, but frequent doses, sometimes proves decidedly beneficial. It is equally useful for the removal of that dry and jaundiced state of the skin, with œdema of the feet, which is apt to remain after protracted miasmatic fevers. One grain of this antimonial, dissolved in three pints of water, or some mild and pleasant ptisan, and used as common drink for two or three weeks, will generally clear the skin of its icterode hue, and keep up a regular action of the bowels and cutaneous exhalents.

Given in this way, I have also known this article to act very beneficially in subacute rheumatic affections, more especially in those instances of rheumatic muscular pains and œdema, which are apt to proceed from the influence of cold, during convalescence from scarlatina and measles.

I have already mentioned the employment of emetics in hernia humoralis. In this affection the tartrate of antimony is decidedly more efficacious than any other emetic. It should be given so as to produce full vomiting.

James's Powder, a preparation which approaches very nearly to the character of tartar emetic, is said to be highly useful in hydrocephalic affections. Dr. William Stoker, of Dublin, who speaks particularly in favor of its efficacy in affections of the head, has also published some very favorable results from its use in apoplectic cases. He affirms, that it has a decided tendency to diminish the determination of the blood to the head; and that a continued use of it, in small doses, generally tends to diminish the disposition to apoplexy.*

* Dublin Medical Essays, anno 1806. See also vol. ii. p. 43, of the "Transactions of the King and Queen's College of Physicians, Ireland.

Tartar emetic is sometimes employed, in nauseating doses, to bring on relaxation of the muscles, in order to facilitate the reduction of dislocated joints. Dr. Chapman says, that he has known it to be advantageously administered in the form of an enema, for the purpose of evacuating the stomach, in order "to remove poison which had been swallowed." He has also used the remedy in this way, in a case of tetanus, "with such complete success," that he entertains "the hope that, under this treatment, the disease may hereafter be divested of some portion of its terrors and mortality." This practice has, I believe, never been resorted to by any other physician.

Dr. Witzman, a Russian physician, has lately recommended the employment of tartar emetic for removing opacity of the cornea. The remedy is to be applied in the form of an ointment, composed of fresh butter and castor oil, āā ʒi, tart. antim. gr. iv, and afterwards gradually increased to twenty grains. A small portion of this ointment is to be put into the eye every morning and evening; and a warm compress applied pretty firmly, for two or three hours after the introduction of the ointment, in order to allay the pain which it sometimes creates.* For an account of the employment of tartar emetic as a counter-irritant, the reader is referred to the chapter on Rubefacients in this work.

Tartar emetic, as has already been stated, is capable of acting with great violence; and when the quantity taken is enormous, its effects are eminently deleterious. If it excites great vomiting, with cramp in the stomach, the patient should be directed to take copious draughts of sugar and water. "If the vomiting do not cease after the tartar emetic may be supposed to have been ejected, and the pain is augmented, a grain of opium may be given, and repeated at an interval of a quarter of an hour, for two or three times, if the symptoms be not calmed." When the symptoms continue still to increase, leeches should be applied to the abdomen and throat. If the individual who has taken the antimonial preparation does not vomit, and yet suffers from the other symptoms, several glasses of sugar and water should be taken; if, in spite of this, vomiting do not occur, the following should be given at repeated doses: "Put four or five gall-nuts into two quarts of water; let them be boiled together for ten minutes, and then strained. Experience has proved that gall-nuts are to be preferred to any other astringent; but, in default of them, two ounces of Peruvian bark, or the bark of oak or willow, may be employed."† If, notwithstanding these applications, the symp-

* Russian Physico-Medical Repository, &c., edited by E. Martini.

† Orfila's Directions for the treatment of Persons who have taken Poison, p. 60.

toms continue, we must resort to general and local depletions, blisters, or fomentations to the region of the abdomen, together with copious draughts of mucilaginous drinks, warm bath, &c.

M. Sauventon, of Lyons, has lately published a case, illustrating the good effects of the Peruvian bark in cases of poisoning by this article. A lady swallowed, by mistake, about a drachm of tartarized antimony in whey. M. Sauventon saw her in ten minutes after, and immediately administered about two ounces of tincture of yellow bark, diluted in several glasses of cold water. The only injurious effects the patient experienced from the poison were some nausea and epigastric pain, which latter continued more or less for four or five weeks.*

Formulæ.

℞.—Pulv. ipecac. ℈i;
Tart. antimon. gr. ii.—M. To be taken at once, as an active emetic.

℞.—Tart. antimon. gr. viii;
Aq. fontanæ ℥iv.—M. Take a tablespoonful every ten or fifteen minutes, until vomiting is excited.

℞.—Sulphat. magnesiæ ℥iss;
Tart. antimonii gr. ii;
Aq. fontanæ ℥v.—M. Take a tablespoonful every hour, until it operates as an emeto-cathartic.

NITROUS POWDERS.

℞.—Pulv. nit. potassæ ʒiss;
Tart. antimonii gr. i;
Calomel gr. vi.—M. Divide into six equal parts. Take one every hour or two.

ENEMA.

℞.—Tart. antimon. ℈ss.
Decoct. hordei Oj.

SULPHAS ZINCI.—WHITE VITRIOL.

Sulphate of zinc consists of a white, semi-transparent salt, crystalizing usually in slender four-sided prisms, terminated by four-sided pyramids. It effloresces on the surface when exposed to the open air, and has the property of reddening vegetable blues. It has a styptic, metallic and somewhat acidulous taste. It is dissolved by 2·5 times its weight of water at the temperature of 60°; and by less than its weight of boiling water. Alcohol

* Med. Chir. Rev., July 1826, p. 285.

has no action on it. "When heated, it dissolves in its water of crystalization, which gradually evaporates; and by prolonged ignition, the whole of the acid is expelled, and oxide of zinc is left." The caustic alkalies precipitate its oxide, and afterwards dissolve it when added in excess. The alkaline carbonates, earths, hydro-sulphurets, astringent vegetable infusions, and milk, destroy or weaken its styptic powers. Ammonia, however, produces no change in a solution of *pure* sulphate of zinc, but the ferro-cyanate of potassa produces a white precipitate.

As this preparation of zinc is usually met with in commerce or in shops, it consists of irregular, white and opaque masses, of a granular structure, bearing some resemblance to white sugar. In its crystalized state, the salt is composed of one equivalent of sulphuric acid = 40, one of zinc = 42, and seven of water = 63. The amorphous or common white vitriol of the shops contains only three equivalents of water.

Its remedial effects vary according to the dose in which it is administered. Given in a small dose, from one-half to two grains, it acts as an astringent tonic. In larger doses, from ten grains to ʒss, it is strongly emetic.

Sulphate of zinc is the most prompt emetic with which we are acquainted; and hence its peculiar applicability to cases where poison has been swallowed, and where, of course, it is of the utmost consequence to procure speedy and effectual vomiting. Previous to the discovery of tartarized antimony and ipecacuanha, this preparation of zinc was very commonly employed as an emetic in all cases where emesis was desired. At present, however, its use as an emetic is almost entirely restricted to the purpose just mentioned. The objection alleged against its employ ment by Cullen, namely, "that it is apt, if not thrown up again immediately, to continue a disagreeable nausea, or even vomiting, longer than is necessary," does not appear well founded. Mosely, indeed, gives quite a contrary character to this remedy. His experience with it was very extensive, and his opinion upon this point is, therefore, entitled to respect. He affirms, "that the patient is not harassed with its operation; that it is never violent as antimonials are, and generally instantaneous, and suddenly over, always leaving the stomach strongly invigorated. Neither does it cause spasms in the viscera, nor any nervous affections—mischiefs often produced by the antimonials."

I have exhibited this substance, with a view to its emetic operation, in a very considerable number of instances, and sometimes to the extent of thirty grains, without ever noticing any of the disagreeable consequences mentioned by Cullen. It does not appear, indeed, that its effects on the system, even when taken in excessive quantities, are eminently deleterious. Orfila men-

tions the case of a young lady, who by mistake took a solution of two ounces of white vitriol. On his arrival, "he found the lady in a dreadful situation; her countenance was pale and sunk, the extremities cold, the eyes dim, and the pulse convulsive." Vomiting, however, soon came on, which was promoted by draughts of warm water. After the greater portion of vitriol had been evacuated, "he set about decomposing the rest by means of the fixed alkali, diluted with sugar-water." The vomiting now ceased instantaneously, and in less than two hours she was free from every painful or alarming sensation.

Richter states that he has frequently given this article as an emetic in the commencement of typhus with great advantage: and from its sudden and rapid operation, there can be no doubt that it is well calculated to do good in affections of this kind, since the general shock and agitation of the system produced by emetics are, perhaps, the principal source of the benefits afforded by these remedies.*

It has also been recommended as an emetic, in the initial stage of bilious fevers, and for arresting the progress of intermittents. For this latter purpose, a full emetic dose should be given as soon as the patient begins to feel the premonitory symptoms of the approaching paroxysm. Given at this period, it is said frequently to prevent the development of the paroxysm, and thus often to arrest the progress of the disease effectually. (*Richter.*)

Moseley recommends this remedy as very useful in dysentery. "I give it," says he, "at first without alum, in sufficient doses to cause evacuations, and afterwards with the alum, in nauseating doses, and frequently with opiates at night."† I have used this preparation in the dysentery of children, after it had assumed a chronic character, and generally with considerable advantage. I have always, however, confined myself in these cases to the employment of nauseating doses; and it should never be used until the inflammatory symptoms have been moderated by depletory measures, and the bowels freely evacuated by suitable laxatives. In referring to the testimony of Moseley in favor of this practice, it must be recollected that he employed it in *tropical* dysenteries; a circumstance which may, perhaps, account for its less favorable results in the treatment of the disease in more northern climates. Mr. Bampfield, who has published an excellent book on tropical dysentery, makes the following observations in relation

* Specielle Arzneimittellehre, Bd. 2. p. 538.

† The following is his formula for exhibiting the white vitriol with alum. Sulph. zinci ʒiii; sulph. alum. ʒi; pulv. coccinel. gr. iii; aquæ bulentis, ℔i. Mix these in a mortar, until the solution is cold, and the sediment deposited; then pour off. Dose, a tablespoonful for an adult.

to Moseley's zinc mixture: "The mixture of sulphas zinci and alum, recommended by Dr. Moseley, has nearly the same effects on the intestines as the infusion of simaruba, if there be an excess of alum. It is extremely difficult to adapt the proper quantity of alum to the astringent effect required; when it produces constipation, the morbid secretions, tormina, &c., are increased, and sometimes induce an actual relapse, and when the excess of sulphas zinci maintains a free discharge of natural feces, the morbid secretions are diminished."*

In the treatment of diarrhœa, this remedy appears to be more decidedly advantageous, and is certainly less hazardous than in dysentery.

Dr. Moseley speaks also in favor of the employment of the zinc and alum solution, in colica pictonum. After the bowels are evacuated by suitable purgatives, a tablespoonful of the solution is to be taken every five or six hours, until the pain ceases. Of this practice I can say nothing from my own experience, nor does it appear to have gained much credit with the profession.

Since, however, the preceding remark was written, I have employed this solution in two cases of colica pictonum, and in both instances unequivocal benefit was derived from it. The proportion of alum, however, in the solution I employed, was double that which is given in the formula at the foot of page 65.

To relieve hooping-cough, the sulphate of zinc is, undoubtedly, a remedy of very considerable powers. For this purpose I have prescribed it in a few instances with considerable advantage. I think it decidedly superior to the antimonial emetics, in cases where there is much pulmonic oppression, or difficult respiration. The only objection to its use, is its very disagreeable taste, a circumstance, indeed, which renders its employment with children extremely difficult, and often altogether impracticable.

As an expectorant, in chronic catarrhal affections, attended with oppressed breathing and a tough mucous expectoration, the same writer whom I have already so often mentioned, speaks in exalted terms of his "vitriolic solution." He directs it to be taken in slightly nauseating doses, three or four times a day. In phthisis, attended with bloody expectoration, he declares this remedy to be of signal service. In all these affections I have occasionally employed it, but never with any decided advantage. Dr. Paris, however, adds his testimony in favor of the use of this remedy in pectoral complaints. "In affections of the chest," says he, "attended with inordinate secretion, I have witnessed

* Practical Treatise on Tropical and Scorbutic Dysentery, p. 193. London, 1819.

much benefit from its exhibition, particularly when presented in the form of lozenge."

The sulphate of zinc has, of late years, been much extolled, by some practitioners, as an emetic in cynanche trachealis, and C. laryngea. Dr. Hosack has made some statements, which go to show that prompt and peculiar advantages may often be obtained from emetic doses of this article in croup. Dr. Francis, of New York, has employed it, in this affection, with marked success. In three instances, after the frequent but unavailing use of antimonial and ipecacuanha emetics, and in an apparently hopeless condition of the patients, the exhibition of a solution of sulphate of zinc, (a drachm to an ounce of water,) in doses of a teaspoonful every ten minutes, caused, by the sudden and energetic vomitive efforts it excited, the separation and expulsion of the false membranes which had been formed in the trachea and larynx, and secured the recovery of the patients.*

This article may also be very appropriately and successfully used as an emetic, in cases of apoplexy excited by an overloaded stomach, or by indigestible and oppressive ingesta.

Under the head of Astringents this remedy will be again noticed, to which the reader is referred for an account of the various other uses to which it has been applied in medical practice. "The white vitriol of commerce," says Dr. Paris, "ought never to be used in medicine, since it generally contains the sulphates of copper and iron."

SECONDARY EMETICS.

LOBELIA INFLATA.—INDIAN TOBACCO.

This is a biennial plant, indigenous to the United States, in many parts of which it grows in great abundance. For a particular description of this species of lobelia, the reader is referred to Dr. Bigelow's American Medical Botany, and to Dr. Barton's Vegetable Materia Medica of the United States, where accurate figures are given of the plant. The leaves, capsules and root of this plant are exceedingly acrid; when "held in the mouth for some time, they produce giddiness and pain in the head, with a trembling agitation of the whole body; at length they bring on extreme nausea and vomiting. The taste resembles that of tartar emetic."†

* Essays on Various Subjects of Medical Science. By D. Hosack, M. D.

† Bigelow's Medical Botany, vol. i. p. 179.

As an emetic, the lobelia inflata is very active, producing, in strong doses, "great relaxation, debility, and perspiration." Concomitant with its emetic operation, it sometimes acts on the bowels and produces purging. Shoepf, a botanist who traveled through this country about eighty years ago, is the first writer who has mentioned this plant as possessed of medicinal properties. He notices it, however, only as "*astringent and used in ophthalmia*," without saying anything further concerning its medicinal powers. Our knowledge of its virtues as a medicine has been chiefly derived from the account given of its effects by the Rev. Dr. M. Cutler, whose experience with it appears to have been very considerable. He found it particularly serviceable in asthmas. "It has been my misfortune," says he, "to be an asthmatic for about ten years. I have made trial of a great variety of the usual remedies, with very little benefit. In several paroxysms I found immediate relief, more frequently than from anything else, from the skunk-cabbage, (pothos fœtidum.) The last summer I had the severest attack I ever experienced. It commenced early in August, and continued about eight weeks. Dr. Drury, of Marblehead, also an asthmatic, had made use of a tincture of the Indian tobacco (lobelia inflata) in a severe paroxysm, early in the spring. It gave him immediate relief, and he has been entirely free from the complaint from that time. I had a tincture made of the fresh plant, and took care to have the spirit fully saturated, which I think is important. In a paroxysm, which, perhaps, was as severe as I ever experienced, and the difficulty of breathing extreme, after it had continued for a considerable time, I took a tablespoonful. In three or four minutes my breathing was as 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 a very little moderate puking, and 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."* Other practitioners have employed this article with decided advantage in asthmatic affections. Dr. W. P. C. Barton mentions a case of this kind in which he exhibited a teaspoonful of the tincture every two hours, with speedy and obvious benefit. Dr. Stewart, also, as I am informed by Dr. Barton, has obtained unequivocal advantages from the employment of this remedy in a case of spasmodic asthma. Dr. Cutler has found it a very useful pectoral "in consumptive and other coughs depending on mucus accumulated in the bronchial vessels."

* Thacher's Dispensatory.

Since the publication of the first edition of this work, I have had several very striking examples of the good effects of this article in asthma. Its operation is, indeed, often surprisingly prompt and effectual in this disease. I have known the most frightful paroxysm completely allayed in less than fifteen minutes. My experience, since the last edition, has still further confirmed my confidence in this article as a remedy in asthma. Even where the disease depended on organic affection of the heart, it has, generally, speedily mitigated the distressing difficulty of respiration.

As an emetic, I have employed it in several cases of croup, with very great benefit. I have also used it effectually, instead of tobacco, in the form of an enema, to facilitate the return of a strangulated hernia.* I have, within the last four years, employed it in a number of cases of hooping-cough; and in several instances with unequivocal advantage. From fifteen to twenty drops, in union with ten or twelve drops of the syrup of squills, may be given every two or three hours to a child of between one and two years old. Combined with the extract of belladonna, it forms a most valuable remedy in this affection. I have used this combination with immediate and very decided benefit. By dissolving about five grains of the extract in an ounce of decoction of lobelia, (half an ounce of the plant to half a pint of water,) and giving it in doses of from twenty to sixty drops, according to the age of the child, three or four times daily, will seldom fail (as I confidently believe) to mitigate, very decidedly, the violence and frequency of the spasmodic cough. In a weak or torpid state of the stomach, unattended with symptoms of inflammatory irritation of the mucous membrane of this organ, I have found small doses of this medicine highly beneficial. It evidently possesses the power of exciting the pneumogastric nerves, and, when indigestion depends on a mere want of activity in the stomach, its effects in exciting the nervous energies of this organ, are often promptly and conspicuously advantageous.

The plant should be collected in August, and plucked up by the roots. Every part of it possesses active qualities, but the roots and the inflated capsules are decidedly the most powerful. It may be given either in the form of powder or tincture. The latter is, however, the most convenient mode of exhibiting this remedy. The formula adopted in the American Pharmacopœia, for making the tinctura lobeliæ, is given below.† As an emetic,

* Barton's Vegetable Materia Medica, vol. i. pp. 197-9.

† ℞. Lobeliæ uncias duas.
Alcoholis diluti octantem unum.
Digere per dies decem, et per chartam cola.

we may give from ten to twenty grains of the powdered leaves, to an adult. In smaller doses its effects are expectorant. The saturated tincture is administered in the dose of from twenty to forty drops, to children of one or two years old.

SPIRÆA TRIFOLIATA.—INDIAN PHYSIC.

This is an icosandrous plant, and found in considerable abundance throughout almost every part of the United States. Its root is perennial, sending up annually several slender stems, to the height of several feet, branching above, and of a reddish color. It flowers in June and July, and delights in hilly woods or on the borders of rivulets. The root, which consists of "long, brown, slender branches, radiating from a thick tuber," is the part employed for medicinal purposes. It is said that the cortical part of the root alone possesses active qualities. "The predominant soluble ingredients in this root appear to be a bitter extractive matter and resin. When boiled in water, it imparts to it a beautiful deep red-wine color, and an intensely bitter taste. This decoction undergoes no change from the action of alcohol or gelatin, though it gives a precipitate with muriate of tin. Water distilled from the root has its peculiar flavor with a little of the bitterness. A large portion of resin is precipitated on the addition of water to an alcoholic tincture of the root."* From my own experience with this plant, which has not been inconsiderable, I am led to regard it as very little inferior to the officinal ipecacuanha, as an emetic. Like this latter article, it is a safe and efficacious vomit. While practising in Lancaster county, I employed this plant very frequently as an emetic, in the treatment of intermittent and bilious fevers, and it very seldom disappointed me of the desired effect. Dr. Bigelow, however, observes, that from his own experience with this remedy, he was led to regard it as an emetic of very uncertain operation.

Given with opium, I have found it particularly serviceable as a sudorific in dysenteric affections; and from what I have observed of its effects in other cases, it appears to me, that the opinion entertained by the late Dr. Barton, of its possessing tonic properties, is not without foundation. In small doses, from two to four grains, I have taken it myself, when suffering from dyspepsia, and generally with some advantage.

As an emetic, it should be given in the dose of about thirty grains of the powdered root. It should be collected in September. Accurate figures of this plant are given in the first volume of

* Dr. Bigelow's American Medical Botany, vol. iii. p. 14.

Barton's Vegetable Materia Medica of the United States; and in the third volume of Bigelow's American Medical Botany.

EUPHORBIA IPECACUANHA.

This plant is found nowhere except in the United States. The root is perennial, long, tuberculated, from half an inch to an inch in diameter, and of a yellowish color. It is light and brittle when dried, and has a sweetish and not very disagreeable taste. Dr. Bigelow subjected this root to chemical examination, from which it appears that "sulphuric ether, digested on the powdered root, dissolved a part of it; and this ethereal solution gives a precipitate if alcohol is added to it. Alcohol alone takes up another portion of the root, and assumes a pearly turbidness after water is added. Both the ethereal and alcoholic solutions, evaporated to dryness, leave a residuum which is fusible and inflammable. The decoction gives no precipitate with gelatin or sulphate of iron. With alcohol it gave out a white precipitate, which rendered the solution turbid, and subsided in flocks. The cold infusion exhibited the same phenomena in a smaller degree. From these experiments we may infer that the root contains caoutchouc, resin, mucus, and probably fecula." For a good description and figure of this plant, the reader is referred to Dr. Barton's Vegetable Materia Medica, vol. i. p. 213, and to Dr. Bigelow's American Medical Botany, vol. iii. p. 111.

The emetic virtues of this plant had been but little noticed, until they were more particularly investigated by Dr. Barton, the present Professor of Botany in the University of Pennsylvania. In his work, to which we have just referred, he observes: "That the Euphorbia Ipecacuanha is possessed of virtues entitling it to supersede the use of the imported ipecacuanha, my own extensive experience with it, corroborated by the numerous trials of the medicine by Professor Hewson, my brother, Dr. J. R. Barton, of the Pennsylvania Hospital, and others, all embolden me to declare." Dr. Bigelow states, that, in the trials which he has made with it, he has found it, in the majority of instances, to operate with as much ease as the other emetics. In large doses, however, "it excites active and long-continued vomiting, attended with a sense of heat, vertigo, indistinct vision, and prostration of strength."* From what I have myself seen of this remedy, I am satisfied that it is well worthy the attention of the profession. Given in the dose of from fifteen to twenty grains, the powdered root of this plant acts as a safe and efficacious emetic. It seems

* American Medical Botany, vol. iii. p. 112.

to have a greater tendency to act on the bowels than ipecacuanha, as I have known it to produce very considerable purging. In the dose of twenty-five grains, Dr. Barton has known it to produce hypercatharsis, which continued for fourteen hours. It may be advantageously substituted for ipecacuanha, in the various "combinations into which this latter substance enters as a part." As the officinal ipecacuanha is but seldom very good, or perhaps unadulterated, it is a matter of very considerable importance to attend to such native articles as promise to become adequate substitutes in its place. In this respect there is, perhaps, no indigenous vegetable known, which deserves greater attention from the profession than the Euphorbia Ipecacuanha.

SCILLA MARITIMA.—SQUILL.

The squill belongs to the liliaceous plants. It is a maritime plant, and found in great abundance on the sandy coasts of Portugal, Spain, Sicily, &c. The root, which is the only part employed in medicine, consists of a large bulb, composed of fleshy scales, which overlap each other and give it a pyriform shape. It has no odor, but is bitter, nauseous, and acrid to the taste. The recent root will inflame the skin if kept in contact with it for any considerable time. According to the analysis of Vogel, it contains six parts of gum, twenty-four of tannin, six of sugar, thirty-five of bitter principle, (*Scillitin*, which is white, transparent, and breaks with a resinous fracture,) and thirty of woody fibre.*

The squill, when taken in very large doses, acts with great and dangerous violence on the animal economy. It has been known to produce excessive tormina, colic, and even convulsions. Alibert asserts that he has performed many experiments on animals with this substance, and that the result confirmed what had been said of its effects in this respect.

It is chiefly employed as a diuretic and expectorant; for both of which purposes it is, indeed, one of our most valuable remedies. As an emetic it is but little used. In the pectoral diseases of very young children, however, it may often be resorted to with peculiar advantage. I have frequently prescribed the syrup of squill, so as to produce vomiting, in the catarrhal affections of infants; and it has appeared to me, in some instances, to produce greater relief than usually arises from the operation of other articles of this class. In hooping-cough, too, the vinegar of squill, in union with vinum ipecacuanhæ, has appeared to me to

* American Medical Botany, vol. iii. p. 112.

constitute a peculiarly beneficial emetic. I have lately employed this mixture, in a few cases of this disease, with a highly satisfactory result. Two parts of the acetum scillæ, with one of the vin. ipecac., may be given in teaspoonful doses, to a child between one and three years old.

The active principle of this root is readily and perfectly extracted by any of the usual menstrua. Water distilled from squill has neither taste nor smell, and is wholly destitute of active properties. According to the analysis of M. Tilloy, of Dijon, the *Scillitin* of Vogel is a compound of the proper active principle of squill, gum, and uncrystallizable sugar. The scillitin, as obtained by Vogel, is soluble in water, alcohol, and vinegar; but that which was procured by M. Tilloy was insoluble in water and in dilute acids, though readily dissolved by alcohol. It has an exceedingly acrid and bitter taste, and exerts a very powerful influence on the animal system. It is probable, however, as is remarked by M. Chevallier, that the active principle of this root "has not as yet been entirely isolated." The officinal preparations are, *Acetum scillæ*, U.S., Lond., Ed., Dub.; *Mel. scillæ compositum*, U. S.; *Oxymel scillæ*, U. S., Lond., Ed., Dub.; *Pilulæ scillæ compositæ*, Lond. Ed., Dub.; *Pulvis scillæ*, Ed., Dub.; *Syrupus scillæ*, U. S., Ed.; *Tinctura scillæ*, U. S., Lond., Ed., Dub.

To procure an emetic effect, the fluid preparations must be given in the dose of an ounce or more to an adult. A teaspoonful of the syrup is generally sufficient to puke a child under a year old.

Alkalies diminish both the bitterness and acrimony of this root. Vegetable acids do not materially affect either of these qualities, but are supposed to increase its expectorant powers.

For an account of the other medicinal properties of this root, see the chapters on Diuretics and Expectorants.

SANGUINARIA CANADENSIS.

This plant is generally known by the name of Poccoon, or blood-root, and grows abundantly throughout every section of the United States. It is among the earliest of our spring plants, shooting up its humble but beautiful white flowers as soon as the frost leaves the earth. The root, which is the only part employed as a medicine, is red, horizontal, and tuberous; its taste is acrid, leaving an impression on the fauces some time after it is chewed. According to the minute analysis of this root by Dr. Fitzgerald Bird, it appears to contain cinchonin, extractive matter, a gummy matter, a resin, and gallic acid, in a state of combina-

tion.* The coloring principle of this root resides chiefly in its resinous parts, the alcoholic solution being always more than twice as highly colored as the aqueous.†

The medicinal properties of the sanguinaria have been very variously represented, and its powers do not appear to be, as yet, well understood. Dr. Bigelow considers this root as an acrid narcotic. Dr. Bird says that "its medicinal properties are in *every respect* similar to those which characterize the cinchona officinalis." This, however, is certainly an erroneous estimate of its powers, for although it will often speedily put a stop to intermitting fever, its tonic virtues in this, as in every other respect, are incomparably below those of the cinchona. The late Dr. Barton valued it chiefly for its emetic and expectorant powers. Its properties are certainly very peculiar, being capable of producing tonic, narcotic, stimulant, or emetic effects, according to the dose and form in which it is administered. Taken in a large dose, it produces nausea, heat in the stomach, faintness, often vertigo and indistinct vision, and finally emesis. These effects are produced by doses of from eight to twenty grains.‡ In smaller doses, its effects on the pulse are analogous to those of digitalis. Since the last edition of this work was published, I have employed this article in a very considerable number of cases; and I am fully satisfied that its sedative influence on the action of the heart and arteries, is quite as certain, if not more so, than that of digitalis. It rarely, however, produces any obvious reduction of the frequency and tension of the pulse, until its use has been regularly continued for five or six days; and in the majority of cases in which I have employed it, I did not notice this effect on the pulse, until the eighth or tenth day of its use. Applied in the form of powder to fungous flesh, it evinces pretty active escharotic properties.

From the concurrent testimony of a number of eminent practitioners, the sanguinaria appears to be entitled to considerable attention as an article of the materia medica. Professor Francis, of New York, in an interesting paper on the medicinal properties of this plant, states that he has used it "with essential benefit in a long protracted and distressing affection of the chest. The patient labored under repeated attacks of pneumonia, and, notwithstanding very active treatment, had suffered by hemorrhage from the lungs; the consequences were, much constitutional debility, and habitual returns of spasmodic dyspnœa, similar to those

* An Inaugural Dissertation on the Sanguinaria Canadensis, by Fitzgerald Bird, of Georgia. New York, 1822.

† Bigelow's Medical Botany, vol. i. p. 79.

‡ Bigelow's American Med. Botany.

of pertussis. The tincture of the sanguinaria, to the amount of twenty drops, three times a day, has obviated the most formidable symptoms, and given strength and vigor to the constitution."* Dr. Ives, of New Haven, also speaks very favorably of its remedial powers in diseases of the lungs and liver. "In plethoric constitutions," he observes, "when respiration is very difficult, the cheeks and hands become livid, the pulse full, soft, vibrating, and easily compressed, the blood-root has done more to obviate the symptoms and remove the disease than any remedy he has used." It should be given in large doses in cases of this kind, he observes, and repeated until it produces vomiting. He also recommends it as highly useful in influenza, hooping-cough, and croup. In this latter disease, it must be given so as to produce vomiting.† In protracted catarrhal affections, assuming the character of incipient phthisis pulmonalis, the regular employment of small doses of the tincture of this root, has, in my practice, not unfrequently afforded complete relief. In cases of this kind, indeed, the article deserves to be regarded as undoubtedly among the most valuable remedial agents we possess. It seldom, however, produces any very obvious amendment in the symptoms of the disease, until its use has been regularly continued for about two weeks. After it has been persisted in for ten or twelve days, the cough and frequency of the pulse begin to abate, and although this abatement is generally slow, it usually goes on regularly, until all the symptoms of pectoral and general irritation have disappeared. I have generally ordered the tincture (U. S. Pharm.) in doses of from twenty to thirty drops, three times daily; or in less doses, should this quantity excite nausea or vomiting, which it sometimes does in persons of feeble and irritable habits. For the troublesome cough and pectoral uneasiness which are sometimes left after an attack of croup, or pneumonia, I have in some instances prescribed this tincture with the most satisfactory results.

Dr. Francis, in the paper which I have already quoted, states that he has used this remedy with advantage in a "formidable case of acute rheumatism, occurring in a gouty habit, the patient having been previously prepared by copious blood-letting, cathartics, and sudorifics. The patient took thirty drops of the saturated alcoholic solution, three times a day." Dr. Macbride, of Charleston, South Carolina, in a letter to Dr. Bigelow, states that he has found it useful in hydrothorax, "given in doses of sixty drops *ter in die*, and increased until nausea followed each dose." I have administered this remedy in doses of about twenty drops a day (the saturated alcoholic tincture), with unequivocal benefit

* New York Med. and Phys. Journal, vol. i. No. 2.

† Bigelow's American Med. Botany, vol. i. p. 81.

in an asthmatic affection. In this instance, the pulse became reduced about ten strokes in a minute. In another case of weakness of the breast, and copious mucous expectoration, it produced a similar diminution of the action of the pulse, but its good effects were not so conspicuous as in the former instance. In chlorosis, unattended by chronic inflammatory irritation of the mucous membrane of the alimentary canal, I have in several cases known the sanguinaria given in union with the ferrocyanate of iron (prussiate of iron) with peculiarly favorable effects.

As an external remedy, the powdered root has been found very beneficial "in ill-conditioned ulcers with callous edges, and an ichorous discharge." Professor Smith, of Hanover, New Hampshire, states that he has cured several polypi of the soft kind, by using it as a snuff.* I once employed it a long time in a case of this kind, and although it diminished the polypus very considerably for a time, I could not succeed in obtaining any permanent advantage by its use.

Dr. Francis very judiciously observes, that in a state of high general excitement, or in active local inflammation, its employment cannot but prove injurious; for, whatever may be its ulterior effects, it is always actively stimulant in its primary operation.

Two ounces of the powdered root to a pint of diluted alcohol, are recommended as proportions for making its tincture.

Formulæ.

℞.—Pulv. rad. sanguinariæ ℈i;
Ferri ferro-cyanat. ℈ii;
Conserv. rosar. q. s.—M. Divid. in pil. No. xx. One or two to be taken three times daily.

℞.—Tinct. sanguinariæ ℥i;
Tinct. ferri muriat. ℥ss.—M. From twenty to thirty drops, twice or thrice daily.

APOCYNUM ANDOSÆMIFOLIUM.—DOG'S BANE.

This plant is indigenous to the United States, and has been a good deal employed in some parts of this country, as an emetic. Some fifteen years ago, I prescribed it in several cases of intermitting fever, and found it a prompt, and in these instances, a mild and safe emetic. Given in small doses, it forms an excellent tonic in indigestion from debility and torpor of the stomach. The root of the plant alone is used. Its taste is unpleasant and intensely bitter. According to the experiments of Professor Bige-

* Lond. Medico-Chirurg. Transact., vol. i.

low, it contains bitter extractive, a red coloring matter, soluble in water, but not in alcohol, caoutchouc, and volatile oil. Every part of the plant contains a glutinous milky juice. As a tonic it may be given in doses of from two to five grains, three times daily. About twenty-five or thirty grains of the recently powdered root are the proper dose when given with a view to its emetic operation. This root deserves more attention than it has yet received from the profession. The very considerable tonic powers which it unites to its emetic virtues, render it, we may presume, peculiarly suitable to dyspeptic cases. The Indians of this country employ this plant as a remedy in lues venerea.

Dr. Bigelow asserts that the active properties of the root are diminished, and ultimately entirely destroyed, by keeping.

RAD. VIOLÆ ODORATÆ.—SWEET VIOLET.

This species of viola has been introduced into the United States from Europe, and is abundantly cultivated in our gardens. The flowers have a very agreeable odour and a slightly bitter taste. Boiling water extracts both these odoriferous and bitter principles, and the infusion affords an excellent test for acids and alkalies, "being reddened by the former, and rendered green by the latter." Drying, however, destroys their odor entirely. The flowers "should be gathered before they are fully blown, deprived of their calyx, and rapidly dried, either in a heated room, or by exposing them to a current of very dry air." M. Caventou asserts that "it contains a very large portion of *emetin*,"* and Boullay† found a peculiar alkaline principle in every part of the plant, strongly resembling *emetin*, to which he has given the name of *violine*. It consists of a white pulverulent substance, very sparingly dissolved by water, but entirely and readily soluble in alcohol, combining and forming neutral compounds with acids. In a natural state, as it exists in the plant, it appears to be combined with malic acid. According to the experiments of Orfila, *violine* is extremely active, and even poisonous.

The root of this species of violet, which has a bitter and somewhat acrid taste, possesses very considerable emetic properties, and has been used in croup and hooping-cough, with peculiar advantage. The dose of the powdered root, as an emetic, for an adult, is from thirty to fifty grains.

The leaves and flowers are mucilaginous, emollient, and slightly laxative, and "have been used in pectoral, nephritic, and

* Dict. des Sciences Méd., tom. lviii. p. 158.

† Journal de Pharm., t. x. p. 23.

cutaneous affections." I have known it to be used with decided benefit, instead of the *viola tricolor*, for the cure of crusta lactea. A drachm of the dried herb should be boiled in a pint of milk, until about one-third of the milk has evaporated. This must be taken in the course of twenty-four hours, and its use continued for four or five weeks.

ROBINIA PSEUDACACIA.

THE inner bark of this our common locust tree, has a sweetish and slightly acrid taste, and possesses pretty active powers as an emetic. Its operation is generally prompt and mild. An infusion made of an ounce of the bark to a pint of water, may be taken in doses of a small wineglassful every ten minutes, until vomiting is produced. I have known it to be employed with as much advantage as is usually obtained from the ipecacuanha. It is said to be particularly useful in the early stages of dysentery, when given in under doses, so as merely to excite nausea, or but slight vomiting.

SULPHAS CUPRI.—SULPHATE OF COPPER.—BLUE VITRIOL.—BLUE COPPERAS.

THIS salt occurs in the form of rhomboidal prisms of a deep blue color, having an exceedingly harsh and styptic taste. When exposed to the open air, the crystals slightly effloresce on the surface; and when heated they first melt in their water of crystallization, and then dry in a white opaque mass. If the heat be now increased, this white substance "next undergoes the igneous fusion, and finally, at a very high temperature, loses its sulphuric acid, leaving a peroxide of copper." The alkalies, and their carbonates, sub-borate of soda, acetate of ammonia, tartrate of potass, muriate of lime, nitrate of silver, sub-acetate and acetate of lead, chloride of mercury, all astringent vegetable infusions and tinctures, decompose it and alter or destroy its effects. Ammonia throws down from the aqueous solution of this salt, a bluish-white precipitate of hydrated peroxide of copper, which is immediately dissolved by an excess of the ammonia, forming a beautiful transparent deep blue solution, known by the name of *aqua sapphirina.*

This salt consists of one portion of peroxide, with two portions of sulphuric acid, constituting, therefore, a bi-sulphate of the peroxide. It dissolves in four parts of water, at the temperature of

60°, and in less than two, at the boiling point. It is not soluble in alcohol.

The operation of blue vitriol, as an emetic, is very prompt, but its impressions upon the general system appear to be much less powerful and extensive than those of the other articles of this class. When taken into the stomach it very speedily excites strong efforts at vomiting: and though the agitation of the body which it creates is very considerable, yet its impressions seem to be a good deal confined to the stomach, since, neither during the operation, nor after it, does the patient experience that distressing relaxation and general prostration which are occasioned by the other emetics.

As an emetic, this remedy has been very little employed, except in phthisis pulmonalis. Dr. Marryatt* appears to have been the first who used the sulphate of copper in this way. He recommends it to be given in union with tartar emetic, in doses of little more than two grains of each, two or three times a week. Nothing is to be drunk during its operation, and hence he calls it the dry vomit. When diarrhœa attends, he gives one grain of the sulphate of copper with five grains of ipecacuanha.

In a paper on phthisis pulmonalis, published in the first volume of the Transactions of the College of Physicians of Philadelphia, Dr. Senter declares that he "has restored more persons laboring under hectic fever from glandular suppuration, by vomiting every second or third day with the sulphate of copper, and giving, in the intervals, as much as the stomach would bear of Dr. Griffith's myrrh mixture, than by all other methods he has ever tried." He considers this preparation of copper, when united with ipecacuanha, as one of the safest and most efficacious emetics we possess. Dr. Thomas† also adds his testimony in favor of the good effects of this practice. He says that he has adopted it in the treatment of many cases of incipient phthisis "with infinite advantage." Dr. Samuel Fort Simmons‡ likewise speaks very favorably of this remedy in consumption.

That considerable advantage may, at times, be obtained from this practice, in incipient catarrhal consumption, is very probable; but of its powers to restore persons to health who are "laboring under hectic from *glandular suppuration*," is a point at which we may well demur. Formerly, there was but little attention paid to the diverse pathological conditions upon which consumptive symptoms may depend: and all cases attended with cough, slow fever, and a puruloid expectoration, were regarded

* Therapeutics; or, the Art of Healing, 21st edition, 1806.

† Modern Practice.

‡ Practical Observations on the Treatment of Consumption. London, 1780.

as instances of phthisis pulmonalis from ulcerative suppuration of the glands or pulmonary structure. It is now well known, however, that a large proportion of the cases usually regarded as phthisis pulmonalis, do not depend on scrofulous or tubercular disease of the lungs, but frequently on a chronic state of inflammation of the mucous membrane of the bronchia; and it is not improbable, that the cases which yielded to this practice, have, for the most part, been instances of this form of pulmonary affections.

I have known great benefit to result from emetic doses of this salt in protracted cases of diarrhœa. In one instance of this complaint, of more than two months' continuance, the exhibition of three grains of the sulphate of copper, with six grains of ipecacuanha, every fourth day, effected a complete cure, after various other modes of treatment had been ineffectually employed.

When this preparation is taken into the stomach in excessive doses, it acts as a strong poison, producing pain in the throat, stomach, and intestines, accompanied with violent vomitings, "fœtid eructations, hiccup, difficulty of respiration, and almost suffocation; the pulse becomes small, hard, and accelerated, and in certain cases it may be said to vibrate under the finger like catgut. An inextinguishable thirst, difficulty of making water, cramps, the extremities of an icy coldness, horrible convulsions, general decay of strength, the features of the face changed, delirium—death." To counteract these effects, it has been found that the white of eggs, beat up with water, is the best remedy we possess. Sugar is also useful, and by many has been highly praised as an antidote to this poison. Orfila admits the propriety of its employment, but he says it is not a counter-poison. "Liver of sulphur, the alkalies, gallnuts, Peruvian bark, charcoal, &c., considered as counter-poisons, are useless, often dangerous, and ought, therefore, to be banished."*

In the dose of from two grains to five, this article acts as a prompt emetic; from one-eighth to one-fourth of a grain, it operates as a tonic.

MERCURIAL PREPARATIONS.

The subsulphas hydrargyri flavus, or turpeth mineral, is the most active and prompt emetic of the mercurial preparations. It was, at one time, a good deal employed as an emetic, but is now almost entirely neglected, on account of the violence of its operation, and its aptness, sometimes, to excite salivation. It has been

* Orfila.

recommended for the cure of virulent gonorrhœa, and hernia humoralis, in which affections it has been said to act beneficially, both as a mercurial and an emetic. In leprous diseases, it has also been employed with advantage, particularly when they affect robust constitutions. It has likewise been administered with good effects in putrid sore-throat, croup, and in peripneumony.

It is given in the dose of from two grains to six or eight.—Given in smaller doses, it acts as an alterative and diaphoretic. Dr. Hope, senior, states that it forms an excellent errhine when mixed with powdered liquorice-root.

The *corrosive sublimate* has also been employed with a view to its emetic effects. Its use, however, for this purpose, has been properly abandoned, from its violent dangerous effects.

The following indigenous plants possess useful emetic powers—all of which have been recommended and employed as substitutes for ipecacuanha, for the purpose of exciting emesis:

1. *Celastrus Scandeus*—staff-tree. A strong decoction of the bark (an ounce of the bark to half a pint of water) given in tablespoonful doses every fifteen minutes, excites active vomiting.
2. *Dirca Palustris*—leather-wood; moose-wood. The bark of the root is employed. Dose from five to ten grains. Recommended in asthma and intermittents.
3. *Sanguisorba Canadensis*—burnet saxifrage. The root is used. Dose from ten to twenty grains. It is an excellent emetic, and may in most instances be used instead of ipecacuanha, without any disadvantage.
4. *Trillium Cernuum*—drooping three-leaved nightshade. Possesses pretty active emetic properties. The root is used. Dose from ten to fifteen grains every twenty minutes, until vomiting is excited.
5. *Eupatorium Perfoliatum*—boneset; thoroughwort. A strong decoction of the leaves and flowers of this plant, when taken in wineglassful doses, every ten or fifteen minutes, produces free and copious vomiting and strongly excites the cutaneous exhalents. In the initial stage of catarrhal and pneumonic affections, a free use of a decoction or infusion of this plant, so as to excite emesis, often procures speedy and complete relief.
6. *Erithronium Americanum*—dog's tooth violet; adder's tongue. All the parts of this plant are active. In the dose of from twenty to thirty grains, it acts as a mild emetic. It has been recommended as a peculiarly beneficial emetic in the commencement of dysenteric affections.
7. *Euphorbia Corollata*—corollated spurge. The emetic properties reside chiefly in the cortical portion of the root. In the dose of from ten to fifteen grains, it excites active vomiting and protracted nausea.

8. *Apocynum Canabinum*—Indian hemp. The root of this plant is powerfully emetic. It produces great and protracted nausea, and generally diminishes the frequency and fullness of the pulse to a very conspicuous degree. It appears, moreover, to possess narcotic properties, since its emetic operation is invariably followed by drowsiness. In doses not sufficient to excite immediate vomiting, it operates as a powerful hydragogue cathartic. It has been used in dropsy, with entire success, by Dr. Parrish.*
9. *Apocynum Androsæmifolium.* The root, given in the dose of from twenty-five to thirty grains, is a certain and mild emetic. It is a good substitute for ipecacuanha.
10. *Robinia Pseudacacia*—common locust tree. The bark of this tree operates as a mild and certain emetic. An ounce of the green bark boiled in three gills of water, down to half a pint, and given in tablespoonful doses every ten minutes, will excite free and gentle vomiting.

* Inaugural Dissertation. By M. L. Knapp, M. D.—American Med. Review. Philada., vol. iii. p. 197.

CHAPTER III.

CATHARTICS.

CATHARTICS are medicines which evacuate the contents of the intestines downwards, or which, when given in proper doses, produce purging.

As, in many parts of the intestinal tube, its contents are carried forwards in a direction contrary to their gravity, a very considerable propulsive force, it is evident, must be pretty constantly exerted downwards, in order that the alvine evacuations may be regularly effected. This force consists in that series of contractions of the muscular fibres of the intestinal canal from above downwards, called peristaltic motion. Constipation must, therefore, depend either upon a cessation, or an inadequate force of this peristaltic action, or upon some mechanical resistance to its propulsive power, or upon both these causes combined.

Whatever, therefore, increases the alvine discharges, acts either by increasing the peristaltic action of the bowels, or by removing the impediments which oppose its regular propulsive action, or by both these effects.

It is in this latter way that cathartics produce their evacuant effects; for while they excite the peristaltic or propulsive action of the intestinal canal, they also augment its natural secretions. They thus at once increase the force of the propelling power, and diminish the resistance of the substances propelled, by lubricating the internal surface of the bowels, and attenuating their contents by the increasing secretions they produce.

Independent of the different degrees of evacuant power which these remedies possess, they differ also essentially from each other in relation to the particular parts of the intestinal tube upon which they more immediately exert their actions. Thus gamboge, calomel, and a few others, direct their action more particularly upon the upper portion of the intestines; whilst aloes act almost entirely upon the lower portion of the bowels. With regard to the nature and appearance of the evacuations produced by the various articles of this class, the diversity is equally remarkable. Jalap, colocynth, elaterium, gamboge, and the saline purgatives, for instance, produce copious *watery* discharges; castor oil, rhu-

barb, senna, and sulphur, merely evacuate the contents of the bowels; whilst others, as calomel, increase the secretion of the bile, and carry off this fluid in augmented quantities. It is not improbable, as Dr. Paris observes, that the diversity which exists in relation to the part of the intestinal tube upon which different purgatives act, is owing to the different degrees of "the solubility of the active elements" of these remedies. "It is, for instance, easy to conceive," says this writer, "that a medicine may act more immediately and especially upon the stomach, small or large intestines, according to the relative facility with which its principles of activity enter into solution; that those which are dissolved before they pass the pylorus are quick and violent in their effects, and liable to affect the stomach, as is exemplified by the action of *gamboge*, &c., whilst some resinous purgatives, on the other hand, as they contain principles less soluble, seldom act until they have reached the colon. *Colocynth* has a wider range of operation, since its principles of activity reside both in soluble and insoluble elements. *Aloes*, again, being still further insoluble, pass through the whole alimentary canal before they are sufficiently dissolved, and act, therefore, more particularly upon the rectum." A knowledge of these circumstances is of very great consequence, both in a therapeutic and pharmaceutical point of view. For it will not only enable the practitioner to modify the peculiar action of these remedies, by changing the degree of their solubility, but also to select those articles which are thus peculiarly adapted to the particular circumstances of the diseases for which they are prescribed. Thus, in *ascites*, we would be naturally led to employ those purgatives that have a more especial tendency to excite serous evacuations; whilst in cases attended with redundancy or vitiated bile, we would resort to such as act particularly upon the upper portion of the bowels, and at the same time influence the functions of the biliary system. Again, if, in addition to the mere effect of unloading the contents of the bowels, we wish also to produce a determination to the pelvic viscera, to the uterus, for instance, in amenorrhœa, we select *aloes* as the appropriate purgative, because of its more particular action on the rectum.

Besides the more immediate operation of evacuating the contents of the bowels, cathartics produce other effects on the animal economy, to which no small part of their remedial powers may, with reason, be ascribed.

1. They diminish the action of the heart and arteries, and are, therefore, of more or less advantage in all diseases of a sthenic character. They produce this effect not only by evacuating the vitiated or accumulated contents of the bowels, and thereby removing a source of general irritation, but also, by abstracting

from the contents of the blood-vessels, by the increased secretion of serum they produce from the intestinal exhalents. In this respect, the operation of these remedies resembles, in some degree, that of blisters; which, though acting primarily as stimulants upon the sanguiferous system, reduce its action, as a secondary effect, by the evacuation of serum which they occasion.

2. They promote the absorption of fluids from the internal cavities. This effect they produce by a twofold operation; namely, by depriving the blood-vessels of a portion of their serous contents, and by augmenting, as a consequence of this, the re-absorption of serum from those cavities in which it may exist in a state of morbid accumulation. To render this explanation intelligible, it will be necessary to enter into a more particular exposition of the grounds upon which it rests. It appears to be conclusively established, both by direct experiment* and pathological observation, that absorption is accelerated in proportion as the quantity of fluid circulating in the blood-vessels is diminished. It would appear, too, that there is a constant effort in the system to preserve the regular proportion of serum in the blood, and that its inordinate loss by one emunctory, is counterbalanced either by a greater absorption from some of the internal cavities, in which it may be accumulated, or by the diminished action of one or more of the other serous emunctories. Thus, when the exhalents of the peritoneum effuse a preternatural portion of serum into the cavity of the abdomen, producing ascites, the morbid diminution of this fluid in the blood-vessels is, in some degree, counteracted by the *diminished* action of the cutaneous exhalents and of the kidneys. The moment, however, that the kidneys are excited into a more perfect performance of their functions, then (this check to the morbid diminution of the serum of the blood being removed) some new supplying power is requisite to keep up the necessary proportion of serous fluid in the blood-vessels; hence the absorbents are called into action, and the dropsical fluid is re-absorbed into the circulation, and thence thrown off by the regular emunctories. From these facts, we readily perceive the way in which active cathartics promote the absorption of dropsical effusions. By irritating the exhalents of the internal surface of the intestines, a greatly increased secretion and loss of serum are suddenly produced by the action of these remedies. As a consequence of this, not only is the further effusion of dropsical fluid diminished by driving the blood from the exhalents of the cavities to those of the intestines, but its existing quantity is also directly lessened, by the absorbents assuming a more vigorous action, in order to supply the deficiency which the purging has suddenly induced in

* Journal of Experimental Physiology, by M. Magendie, 1821.

the serous portion of the blood. This view of the subject will aid us, I think, in accounting for the fact mentioned by Dr. Paris and others, that cathartics often increase the effects of diuretics. If, for instance, we give a diuretic to a dropsical patient, a slight, but insufficient increase of urinary secretion, for the most part, follows; the absorption is, of course, proportionably small. Let a cathartic be now administered. This will excite a sudden and considerable increase of serous evacuation by the bowels; hence an unusual demand for a restitution of this constituent portion of the blood is created; and, by consequence, a new impulse given to the supplying or absorbing vessels; which, continuing *after* the operation of the cathartic has ceased, will have the effect of supplying the kidneys with a larger portion of the elements of their secretion, and, therefore, enable those medicaments which are calculated to increase their action, to operate more effectually.

3. Cathartics tend to remove the torpor which sometimes prevails in the portal circulation, and thereby to promote the biliary secretion. This they do by exciting "a brisk peristaltic motion of the intestines, whereby the blood, which is accumulated, and as it were stagnated in the portal circle, is propelled forwards."*

4. They produce a powerful deviation of the circulation from the superior to the inferior parts of the body, on the principle of *ubi irritatio ibi affluxus;* and hence their utility in cephalic diseases.

5. They doubtless, also, often produce a new excitement in the nervous system, independent of their evacuant effects, and thereby weaken or interrupt the train of morbid sympathies, or counteract the morbid excitement of certain organs and structures.

It may be observed, that, under particular circumstances, bleeding increases, very considerably, the susceptibility of the intestinal canal to the operation of cathartic medicines. "I have often noticed this fact," says Dr. Paris, "in contending with a plethoric diathesis; whenever the bleeding preceded the purgative, the effects of the latter have been uniformly more speedy and considerable; in obstinate constipation the same fact has been observed, and mild remedies have been known to act more powerfully, when preceded by blood-letting, than potent ones have been exhibited antecedent to it." When torpor of the bowels depends on a congested state of the cerebral blood-vessels, a circumstance often noticed in hydrocephalus, and other cephalic diseases attended with a preternatural determination of blood to the brain, the operation of purgatives may, generally, be much promoted by the application of ice or very cold water to the head,

* Johnson on the Diseases of Tropical Climates.

and sinapisms or fomentations to the feet, after adequate blood-letting.

Having premised these general observations, I pass on to a more particular account of the practical application of this class of remedies. There is no class of remedial agents belonging to the materia medica, whose application is more extensive, or whose aid is more essential to the medical practitioner, than this one. In almost every variety of febrile disease, purgatives are among the most useful curative means we possess. The alimentary canal has been, not unaptly, called the "storehouse of diseases." Whatever may be the original febrile cause, whether seated in the bowels or elsewhere, it is certain that the secretions which are poured into the alimentary canal are, perhaps, in almost every instance of fever, changed from their natural or healthy condition, to a state which renders them additioual causes of irritation to the already preternaturally excited system. Hence simply with a view to remove these additional supporters of febrile action, purgatives are important throughout the whole course of acute diseases. It is, however, not merely by evacuating the vitiated and irritating contents of the bowels, but also by their direct depletory effects on the sanguiferous system, and their consequent power of reducing arterial excitement, that purgatives are beneficial in febrile diseases.

Although purgatives are unquestionably highly useful in every form of fever, yet it must not be forgotten that in all febrile affections there exists a considerable tendency to inflammation of the mucous membrane of the alimentary canal; and that, consequently, no small degree of injury may be done, by too frequent a use of active cathartics. This observation applies more especially to the advanced stages of catarrhal and bilious fevers; for, when these forms of fever become protracted, more or less inflammation is almost always developed in the internal coat of the stomach and bowels. In general, the more active articles of this class of remedies should be rejected, in all febrile diseases where there is a probability that frequent purgation may become necessary for removing the vitiated contents of the bowels. Without adopting the pathology of Broussais, I am yet entirely convinced that purgatives are often exceedingly abused in the treatment of fevers. It is in vain to deny that gastro-enteritis does, very frequently, occur in fevers, and it matters little whether it be secondary or primary, for in either case the irritation produced by the frequent use of *active* cathartics must always inevitably prove injurious.

Not long ago, I met with an instance (in consultation), of the most lamentable abuse of cathartics in a case of fever, apparently excited by checked perspiration from cold. The patient, when I

first saw him, had already been sick about ten days. I was told by the attending physician that there had not been the slightest remission for six days, notwithstanding the daily employment of "*very active*" cathartics. For four days in succession the patient had taken senna and manna, calomel and jalap, and salts; and on the morning when I saw him he had already swallowed a full dose of rhubarb. I found the patient lying on his back, slightly delirious, his knees constantly drawn up, the tongue dry and brown in the middle, and deep red at the tip and edges, and the abdomen tumid, tense, and exceedingly tender to the touch. He died in two days after. Whenever the tongue is red and granulated along the border, or red, smooth and glassy over the whole surface, with a tender, tumid and tympanitic state of the abdomen, and watery flocculent stools, nothing can be more injurious than the administration of active cathartics. The longer I practice, the more I become convinced that the *milder* laxatives are decidedly preferable to the more active articles of this class in fevers; and except in the very commencement, where there is reason to believe that the bowels are in a loaded condition, it will always be advisable to abstain from energetic or irritating purgatives.

Typhus fever having been long considered as essentially characterized, *ab initio*, by debility, purgatives were, of course, almost universally held as improper in its treatment, until Dr. Hamilton, of Edinburgh, pointed out their utility in his estimable work on purgatives. That they are, in fact, not only safe, but eminently useful, in the management of this form of fever, where there are no signs of gastro-intestinal inflammation, is now sufficiently established by the concurrent testimony of the ablest practical writers of the present day. Dr. Rush long since observed, that purgatives are often found to remove, in a sudden and remarkable manner, the *apparent* debility which frequently exists in the latter stages of acute diseases. In the yellow fever he often saw the prostrated strength of a patient suddenly renovated by the operation of a single purgative. That great debility is often produced by the impression of irritating matters on the intestinal nerves, is a fact too frequently witnessed to admit of a moment's doubt. Who has not seen the impressions of indigestible food, in persons of debilitated digestive organs, bring on the most alarming prostration? Why do we so strenuously restrict our debilitated convalescents from taking food, which, in health, would be deemed altogether insufficient to sustain the natural powers? It is because we fear, and justly too, lest it either prostrate the already debilitated vital energies, or raise a tumult in the system dangerous to life. If the natural ingesta are thus able to affect the animal economy, when not fortified by strong digestive powers, is it not reasonable to expect pernicious consequences

from the retention and irritating impressions of the vitiated matters, on the intestinal nerves of the debilitated typhus patient? That the contents of the intestines are more or less vitiated in all febrile diseases, and especially in low typhus fever, is evident, I think, not only from the actual appearance of the discharges themselves, but also from the necessary results of the suspended digestion and morbid intestinal secretions which occur in those fevers. From this view of the subject, therefore, we can readily perceive the utility of employing mild *laxatives* in the latter stage of typhus fever; since we thereby free the system from a powerful cause of irritation, and at once renovate the vital powers, and enable the intestinal emunctories to recover their natural functions. "I have directed a strict attention," says Dr. Hamilton, "to this practice for a long time, and I am now thoroughly persuaded that the full and regular evacuation of the bowels relieves the oppression of the stomach, cleans the loaded and parched tongue, and mitigates thirst, restlessness, and heat of surface; and that thus the latter and more formidable impression on the nervous system is prevented; recovery more certainly and speedily promoted, and the danger of relapsing into the fever much diminished."* These observations apply particularly to the latter stages of typhus, for, in the commencement of this disease, when vascular excitement is pretty active, *active* purgatives will be beneficial, both by unloading the bowels of their irritating contents, and by their direct depletory effects on the blood-vessels.

In relation to the modus operandi of purgatives in typhus, Dr. Armstrong† makes the following remarks, which, though doubtless correct, do not, as this respectable writer would seem to think, invalidate the foregoing remarks concerning the mode in which these medicines produce their good effects in this disease. "Purgatives seem beneficial by unloading the intestines of feces and excrementitious matters, which, when retained, excite and keep up much general irritation. But is it not exceedingly probable, that they have another *and far more salutary effect, in restoring healthy secretion, and in removing irregular distributions of blood from the head, liver, and other parts?* The full operation of aperients sometimes reduces the morbid heat of the skin and the morbid force of the pulse, almost as effectually as the affusion of cold water or venesection; consequences which surely indicate that their action extends further than the mere removal of fecal matter from the intestinal canal." It cannot, indeed, be denied, that the consequences here mentioned do sometimes follow the operation of cathartics; but when we reflect that the

* Hamilton on Purgatives.

† Treatise on Typhus Fever, p. 102. First Am. edit.

very circumstances of a hot and dry skin, an irritated pulse, morbid functions of the intestinal exhalents, and irregular distribution to the head, liver, and other vital parts are in reality often produced by irritating matters lodged in the intestines, it seems evident that these symptoms may be mitigated by mild laxatives, not by any operation independent of their mere evacuant effects, but solely by removing those irritating matters from the bowels upon which the morbid phenomena just mentioned depend.

Dr. Armstrong makes another observation on this subject, to the reasonableness of which I readily subscribe. "I believe," says he, "that purgatives are also beneficial by preventing, through their operation, the absorption of the morbid secretions and excrementitious matter of the intestines; for when these have been allowed to be retained in typhus, I have generally observed a considerable increase of irritation, with an offensive odor from the lungs and from the skin; and, on the contrary, when the morbid secretions and excrementitious matter have been regularly evacuated, there has mostly been a diminution of irritation, with an absence of this peculiar odor."

I have already said that *some* purgatives excite the intestinal exhalents, producing copious *watery* stools, and causing thereby a very considerable reduction of vascular action, whilst others appear to do little more than merely to evacuate the contents of the bowels. This circumstance should be always kept in mind when prescribing purgatives in typhus. For while cathartics of the former kind may answer well in the first stage of the disease, they are, undoubtedly, less proper in its advanced stages than the milder laxatives, when our object is, in general, merely to unload the irritating contents of the bowels with as little reduction of the vital powers as possible.

In all the exanthematous fevers, purgatives are very useful remedies. Their beneficial operation in these diseases would seem to depend chiefly on their power of determining the circulation from the cutaneous to the intestinal capillaries. That the exanthemata are peculiarly characterized by strong morbid excitement in the cutaneous vessels, is perfectly obvious from the manifest character of these diseases. It would, therefore, appear reasonable, *à priori*, to suppose that whatever is calculated to moderate the action of the vessels of the surface, is by this effect equally calculated to moderate the characteristic symptoms of these diseases. It is upon this principle that cold air and tepid ablutions act so beneficially in affections of this kind. It is chiefly during the eruptive fever that purgatives are especially useful in diseases of this kind. After the eruption is completed, it will be best to keep the bowels open by the gentlest aperient remedies, or by the regular employment of laxative enemata. Experience

has taught us that an increased action of the vessels of the intestines, or an afflux of blood to these organs, is almost invariably attended by a simultaneous diminution in the action of the extreme vessels of the cuticular surface, or, in other words, by a partial desertion of the blood from these vessels, and *vice versâ*. Hence, sudorifics are useful in checking intestinal fluxes: and hence, too, cathartics, by exciting intestinal exhalation, act beneficially in the exanthematous fevers. Undoubtedly, however, something is also to be ascribed to the mere removal of the irritating contents of the intestines, and to the *general* reduction of arterial excitement, which these remedies occasion.

In the early stage of scarlatina simplex and anginosa, purgatives are of essential service. Their utility in this disease has been particularly dwelt on by Dr. Hamilton, in his work on purgatives; and Dr. Armstrong adds his testimony in favor of this practice—a practice which is, indeed, pretty universally recommended at the present day. In order to derive the full advantage of purgatives in this affection, it is necessary to produce *brisk* and copious evacuations. For, if the views just given of the modus operandi of purgatives in affections of this kind, be correct, it is evident that such cathartics as act *briskly* upon the bowels, must be most efficacious in this disease. Dr. Armstrong recommends the employment of sulphate of magnesia, with tartrate of antimony, with the view of exciting rapid purging and vomiting. The same observations apply to the use of purgatives in erysipelas.

In no disease are laxatives more decidedly beneficial than in dysentery. Such is the tenderness of the inflamed intestinal canal in this disease, that even its ordinary contents become a source of great and painful irritation. One of the first steps, therefore, in its treatment, is to remove these irritating matters by the employment of such purgatives as will produce a speedy and full action on the bowels; and, as the secretions which are poured into them are, perhaps, in all instances, in a vitiated state, these remedies must be occasionally employed throughout the whole disease. As our principal object, however, is to remove those substances from the bowels which have a tendency to irritate, it is obvious that our purpose will be best answered by such purgatives as will evacuate them with the least possible irritation. It is, therefore, of considerable consequence to select such aperients as are least harsh in their operation, though sufficiently active to induce free evacuations.

Cathartics are highly useful in puerperal fever and peritonitis. Active purging in the onset of these diseases is, indeed, sometimes sufficient, without any other aid, effectually to arrest their progress. Used in conjunction with decisive venesection, purga-

tives constitute the only remedial measures upon which any particular reliance deserves to be placed. There is generally much difficulty in moving the bowels in these affections, and we must, therefore, employ strong doses of the most active of these remedies.

I am decidedly of opinion, both from theoretical considerations and practical observation, that the benefit resulting from purgatives in these diseases will, in general, be proportionate to the activity of their operation. Drs. Abercrombie* and Broussais are of opinion that purgative medicines are injurious in peritoneal inflammations. The latter writer observes, that these remedies are hurtful, "because the vermicular contractions which they excite in the intestines, must increase the morbid sensibility of the peritoneum." The following observations of Dr. James Johnson upon this subject, appear to me to be highly judicious: "In abdominal inflammation, provided the *mucous* tissues are not inflamed, purgative medicines excite the secreting vessels, not only of the whole internal surface of the intestines themselves, but of the glandular organs whose excretory ducts open into the primæ viæ, and thus powerfully deplete *locally* the vascular system of the abdominal viscera. When the portion of 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 we maintain, that to excite the natural action of the mucous membrane, immediately after proper vascular depletions, is a powerful means of checking the peritoneal inflammation; in the same way that a free expectoration from the mucous membrane of the lungs relieves the vascular turgescence and inflammation of the parenchymatous structure or pleural covering of the same organ."†

Dr. Marshall Hall gives an account of a disease peculiar to puerperal women, resembling very closely genuine puerperal fever, in which purgatives followed by opiates would appear to be the only remedies offering any prospect of success; and in which bleeding, according to his experience, is almost certainly fatal. Dr. Hall's description of this disease, as distinguishable from puerperal fever, properly so called, is, however, by no means satisfactory. He has pointed out no marks by which it may be discriminated from this latter disease; there can, however, be no doubt, that great prostration of the vital powers, pain, and arterial excitement, may sometimes arise from intestinal irritation in puer-

* Researches on the Pathology of the Intestinal Canal, in the 63d number of the Edinburgh Medical and Surgical Journal.

† Medico Chirurgical Review, No. 2. Analytical series.

peral women, without the existence of any local abdominal inflammation; and under such circumstances we can readily perceive, that bleeding, especially if copious, would be improper, since it would create additional debility without removing the cause of irritation, which would, indeed, by this very practice, become more pernicious in its effects. The phenomena which distinguish these cases from puerperal fever are the following: The countenance is pale, contracted, and expressive of great distress and exhaustion; the extremities are cool, or about the natural grade of temperature; there is great restlessness, the arms and legs being constantly moved from place to place; the patient complains of a sense of great prostration and sinking; the respiration is short, irregular, and interrupted by deep sighing; a feeling of faintness is felt on raising the head from the pillow; the pulse is usually small, frequent, and sharp; a sense of uneasiness and distress is often experienced in the region of the stomach: the alvine evacuations are commonly thin, frothy, of a pale yellow or ash color, resembling yeast.

From the general antiphlogistic operation of cathartics, it is evident that they are not inapplicable in the treatment of acute rheumatism. They are, in fact, much recommended in this disease by writers of great respectability. "The advantage," says Dr. Scudamore, "of making a detraction from the general circulation by the channel of the alimentary canal, is no less remarkable in rheumatism than in every other inflammatory disease. In proportion as we pursue this practice upon a continued principle from day to day, do we obtain its good effects in acute rheumatism; the circulation becomes moderated, the inflammatory diathesis subdued, and the absorbent system is excited to increased action. Hence we powerfully promote the removal of those excessive secretions of the synovial membranes, which have been already described as causing the distension and impeding the motion of the affected parts. A saline purgative, administered in small doses, and at repeated intervals, is the most advantageous."* Drastic purges are, however, as a general rule, not to be employed in the treatment of this disease. These are, in some degree, incompatible with that regular action of the cutaneous exhalents which seems to be indispensable to the removal of this painful affection. Laxatives, on the contrary, are of unquestionable service; they remove the sources of intestinal irritation; tend to equalize the circulation, and to lessen the action of the heart and arteries, by their evacuant effects upon the extreme vessels of the intestines. As auxiliaries to other antiphlogistic measures, they can seldom be neglected with propriety, in the cure of acute

* A Treatise on the Nature and Cure of Gout and Rheumatism.

rheumatism. Nearly the same thing may be said in relation to the use of cathartics in the treatment of gout. Whatever be the real nature of this disease, it seems certain that there is, perhaps, always more or less functional derangement of the secretory organs of the alimentary canal, and especially of the liver and portal system of vessels.* There is no difficulty, therefore, in accounting for the beneficial operation of purgatives in gout. They not only remove the vitiated and irritating contents of the bowels, but tend also to correct the action of those glands whose products are poured into the alimentary canal, and by detracting from the general circulation, to moderate the febrile excitement, and especially to promote and invigorate the portal circulation, which, according to Scudamore, is in a congested condition.† Dr. Sutton, in his Tracts on Gout, &c., speaks strongly in favor of the employment of cathartics in this disease. Dr. Scudamore states that "he has invariably employed, with the greatest advantage, purgative and diuretic medicines conjointly, so that the exhalent vessels of the alimentary canal, and the secreting function of the kidneys are stimulated to increased action at the same time." Such a union of purgatives and diuretics is particularly serviceable in those cases that are attended with dropsical effusions in the extremities.

In *pneumonic inflammation*, cathartics have not, in general, been regarded as particularly useful, except merely for the purpose of discharging the feculent contents of the bowels. In the early and active stage of the disease, however, free purging is often decidedly beneficial; but after expectoration has been fully established, active and repeated purging seldom fails to do injury by debilitating the system and checking the bronchial secretions.

In the initial stage of *croup*, one or two brisk purgatives are frequently attended with great benefit. In the advanced stage of the complaint, however, rapid purging only tends to exhaust the vital energies, without making any favorable impression on the treacheal affection.

There is no acute disease in which purgative medicines are more indispensable than in acute hydrocephalus. The pathology of this complaint has, of late years, been much elucidated. It appears now to be pretty generally admitted, that it often depends on intestinal irritation. The alvine discharges, in this disease, often afford unequivocal proof of great functional disorder of the liver. They frequently consist of large quantities of black, or green and glairy bile, and seldom, if ever, exhibit the appearance of natural and healthy feces. In post-mortem examina-

* Dr. Scudamore on Gout, p. 74.

† Ibid., p. 100.

tions of hydrocephalic children, Cheyne "found in the liver, the remains of great inflammatory action, and also proofs that undue irritation had existed in the alimentary canal."* And Mr. Abernethy† states, that on dissecting the body of a child that had died of "unequivocal symptoms of hydrocephalus," he found the brain perfectly healthy, *the only diseased appearance being in the bowels.* Dr. Cheyne also mentions the case of a girl, who complaining in the evening of headache, was put to bed by her mother, and was soon asleep; next day, at noon, she was still sleeping profoundly, respiring fully and slowly, with now and then a heavy sigh; the eyes were fixed, the pupils large and immovable. She had been very costive for some days previous, and was languid; she was ordered an enema, and this roused her so far as to swallow a bolus of jalap and calomel. This operated powerfully, and brought away "two chamber-potfuls of the most extraordinary collection of feces" the doctor ever saw. The patient recovered immediately. This case shows, in a striking manner, the powerful influence which intestinal irritation, from acrid or vitiated matters, may have upon the brain. We have a further confirmation of the correctness of this pathology of hydrocephalus, in the fact, that cholera infantum very often terminates in unequivocal symptoms of hydrocephalus. Nor is it an uncommon thing to see children who have long been harassed with indigestion and diarrhœa, die with symptoms of hydrocephalus acutus. Indeed, proofs of the morbid influence of visceral irritations on the brain are so various and palpable, that the most careless observer must have often noticed them.‡

But, whether the disease be an idiopathic, or only a secondary affection of the encephalon, purgative medicines are amongst the most important of our remedial resources. It is evident, however, that where the disease is dependent on a primary irritation in the bowels, cathartics are more especially indicated, since they tend, at once, to remove the remote cause of the disease, and by determining an afflux to the intestines, to lessen the flow of blood to the brain. The bowels should, therefore, be actively moved, in every instance where hydrocephalic symptoms supervene, whatever other measures be adopted. They have a more powerful effect in lessening the action of the circulation in the head, than any other internal remedies we can employ. "Should we

* Cheyne on Hydrocephalus.

† Surgical Observations, part ii. p. 190.

‡ This pathology of hydrocephalus is particularly advocated by Drs. Cheyne and Yates. Spurzheim thinks that the disease is sometimes dependent on primary gastric irritation, but that it is generally an idiopathic cerebral affection.

ascertain," says Dr. Cheyne, "that the alimentary canal is torpid, and imperfectly performing its functions, admitting an accumulation of feculent matter, or that the secretions flowing into it are vitiated or diminished in quantity, which we discover 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, by the stimulating quality of our medicines, we are effecting a most important change in the hepatic system, alimentary canal, and all the parts, including every organ essential to life, which is connected with them."*

For the same reason that purgatives are prescribed in hydrocephalus, namely, to determine the circulation from the head, and to remove the causes of intestinal irritation, are they useful in apoplexy. Whatever speculative notions may be entertained in relation to the pathological character of this disease, all experience testifies in favor of the employment of active cathartics in its cure. As the advantages derived from these remedies, in the present disease, arise probably chiefly from the strong tendency they have to diminish the afflux of blood to the encephalon, and directing it upon the intestines and other gastric viscera, it is evident that the more rapidly they purge, the more beneficial will be their operation in this malady.

Hypochondriasis is, in general, obviously connected with, and often preceded by, a deranged state of the chylopoietic viscera. We may frequently trace the successive grades of dyspepsia up to the full formation of this deeply distressing complaint. It is almost invariably preceded by disorder of the digestive organs. The appetite is either morbidly increased or depressed; a distressing sense of fullness is experienced in the stomach, and there are fetid eructations, with a white tongue, obstinate constipation, and headache. Yet in this disease *active* purging does not appear to be proper, for, as the gastric symptoms just mentioned, and upon which those of the mental affection would seem to depend, arise from a fixed inflammatory *irritation* of the mucous membrane of the stomach and bowels, it is easy to understand why drastic purgatives rather do harm than good. For, although they might effectually remove the vitiated contents of the intestines, yet, as their operation would have a tendency to irritate still more the already too greatly irritated condition of the mucous membrane of the stomach and bowels, it is evident that they cannot be employed with propriety in this affection. The same objection does not, however, exist against the use of *laxatives* in this disease. These, on the contrary, are indispensable auxiliaries in its treat-

* Essays on the Diseases of Children, by John Cheyne, M. D.

ment. By gently exciting the action of the bowels, they tend to restore the natural intestinal and hepatic secretions, and to remove the torpor which, in this disease, prevails in the portal circulation. Purgatives ought to be united with mild bitter tonics, and given in such a way as to procure one, or at most but two, good evacuations every twenty-four hours. There is often an amazing quantity of fecal matter impacted in the lower bowels of hypochondriacs, which has a strong influence in keeping up the disease, and which it is frequently extremely difficult to evacuate by purgatives. When there is reason to suspect the presence of such accumulated contents, there is no way by which we can so conveniently, and at the same time so effectually and beneficially remove them, as by the daily employment of mild and copious laxative injections. These, indeed, should never be neglected in the treatment of this and other chronic diseases, dependent on gastric derangement, accompanied with intestinal torpor.

Hysteria is a disease closely allied to the preceding affection; and its intimate connection with disorder of the digestive organs, is demonstrated by the symptoms of wandering pains in the abdomen, flatulence, acid and fetid eructations and constipation, which characterize the hysteric constitution.* "In my opinion," says Dr. Hamilton, "these symptoms afford conclusive evidence that this gastric affection is primary, and that the other multifarious symptoms of hysteria depend on it. I have, therefore, thought it reasonable to attend particularly to the state of the stomach and intestines, and to employ, in the first place, purgative medicines, to remove the constipation of the body, which most commonly prevails in hysteria." I have been much in the habit of employing purgatives in hysteria. In some instances I have succeeded in putting a stop to the paroxysm by means of a brisk cathartic, after all the ordinary remedies for cases of this kind had been tried with little or no advantage. Purgatives will, however, produce very little benefit in this disease, unless they be administered in doses sufficient to occasion full and active purging. They may be very advantageously united with the fetid gums, particularly assafetida. Dr. Hamilton observes, what, indeed, I have myself repeatedly noticed, that "the first purgatives seem, on some occasions, to aggravate the symptoms; but the practice must not be deserted on this account. The additional irritation which purgatives may give in the first instance, soon passes away; and perseverance in the use of them removes that irritation which gave rise to the disease, which, of course, disappears in proportion as the bowels are relieved of the oppressive mass of accumulated feces." It is evident, however, that in a

* Dr. Hamilton.

disease which, like this one, is so intimately connected with disordered digestive powers, the employment of tonic and gently stimulating remedies will often be found useful along with purgatives.

Chorea is another of the neuroses, in which the employment of purgatives has been especially recommended. That it is often dependent on gastric or intestinal irritation, and connected with great fecal accumulations in the lower intestines, I have not the least doubt; and that, in such cases, purgatives will be useful is at once obvious. Dr. Hamilton strongly recommends a course of active purgatives for the cure of this affection. He has reported several cases which yielded to the influence of repeated purgatives, without the aid of any other remedy. Sydenham, De Haen, and Stoll, speak very favorably of active cathartics in this malady.

"Chorea," says Dr. Hamilton, "consists of two stages. In the first, while the intestines yet retain their sensibility, and before the accumulation of feces is great, *gentle* purgatives, repeated as occasion may require, will readily effect a cure, or rather prevent the full formation of the disease. In the confirmed stage, more sedulous attention is necessary. Powerful purgatives must be given, in successive doses, in such a manner that the latter doses may support the effect of the former, till the movement and expulsion of the accumulated matter are effected." It is absolutely indispensable to pursue this treatment in a firm and decided way, in order to derive permanent advantages from its employment. "Half measures, in instances of this kind, will prove unsuccessful."

It must be confessed, however, that, although chorea may frequently, perhaps generally, have its origin in the alimentary canal, yet we sometimes meet with cases which do not seem to depend upon causes seated in the abdominal viscera, or which, at least, do not yield to a course of purgative remedies. I have seen two cases in which purging was practised copiously and regularly for a reasonable length of time, with no alleviation, but, on the contrary, with a manifest aggravation of the convulsive motions of the patients. One of these patients was finally cured by tonics and antispasmodics, the other did not recover. I have, however, seen other cases, both in my own practice and in the practice of other physicians, which were effectually cured by the plan recommended by Dr. Hamilton. I am, therefore, fully persuaded, that although this mode of treating the disease will not always succeed, it holds out a more certain and rational prospect of success than any other treatment with which we are at present acquainted.

Respecting the employment of purgatives in the treatment of

tetanus, no very satisfactory results have been obtained. When this disease arises from general causes, or, more properly speaking, when it does not depend on any local mechanical injury, it would seem, from the reports of Drs. Hamilton and Burns, to be occasionally remediable by the vigorous employment of purgatives. In the treatment of *trismus nascentium*, or the locked-jaw of infants, purging has also been successfully employed. Dr. Chalmers says, "I have cured one case of the jaw falling of infants, by purging with an infusion of rhubarb, to which a few grains of musk and a little *ol. tart. per. deliq.* were added."* When once formed, however, this disease of infants is but very rarely cured. I know of no authority for the assertion made by Dr. Chapman, that "the utility of purging is indisputably established in trismus nascentium." A very few solitary cases appear on record, in which this treatment was employed with seeming success; but its utility is far, I am sorry to say, very far from being "indisputably established" in this fatal variety of spasmodic disease.†

In the treatment of marasmus, a disease unequivocally and essentially connected with morbid derangement of the digestive organs, purgatives constitute our most important remediate resource. In the first stage of this disease, which, according to Hamilton, extends from its commencement to the accession of the febrile symptoms, and in which "the bowels are not altogether torpid, neither are they overloaded with accumulated feces,

* London Medical Observat. and Inquiries, vol. i. p. 109.

† The following observations on spasmodic diseases are quoted by Dr. Hamilton, from Camper's Anatomico-Pathological Demonstrations.

"Nervis descriptis ad symptomata accedo, quæ ex eorum unionibus facile explanatur; Ordiar autem a pedum tremor, qui hystericis familiaris est. In antecessam vere monere debeo, omnia terribilia hysterica symptomata, quæ tum in singulis, tum in universi corporis locis quotidie videmus, ab acrominia putrida primas vias occupante omnino dependere; excrementorum enim fœtor intolerabilis, fauces, et alia qua præter naturam sunt, rigorum et convulsionum accessum annuntiant. Res igitur ita se habere videtur; plexu mesenterico inferiori affecto, nervi omnes cum eo conjuncti, lumbales, scilicet, et proinde crurales, atque obturatores nervi afficiuntur. Si acrimonia tanta est ut etiam rectum intestinum irritare queat, nervi Ischadici in concensum trahentur, rigebitque pes integer, concucietur, et per vices quiescet, donec animi deliquiem tumultum sedet.

"Infantum inferiorum extremorum convulsiones, ex ascaridibus rectum intestinum occupantibus, hanc theoriam confirmant.

"Purgantia, etiam drastica licet imprudentur abhibita propterea forsan, epilepsia spurias, choream sancti viti, aliosque spasmodicos sanarunt morbos qui desperati a medicis habebantur."

mild purgatives will, in general, effect a cure." When, however, the disease has advanced into the second, or febrile stage, more *active* aperients must be regularly and perseveringly employed. For this purpose Dr. Hamilton recommends the exhibition of small but frequently repeated doses of purgative medicines; "so that the latter dose may support the effects of the preceding ones. When the bowels are once opened, stronger purgatives, given at longer intervals, will accomplish the cure." In my own practice I have obtained the happiest results from the employment of mild purgatives, repeated every third or fourth day, together with a light but nourishing diet, in the treatment of this disease.

Dr. Hamilton speaks favorably of the use of purgatives in the treatment of chlorosis. "The slightest attention to the history of the disease," says he, "evinces that costiveness precedes and accompanies the other symptoms. Costiveness induces the feculent odor of the breath, disordered stomach, depraved appetite, and impaired digestion. These preclude a sufficient supply of nourishment, at a period of growth when it is most wanted; hence paleness, laxity, flaccidity, the nervous symptoms, wasting of the muscular flesh, languor, debility, the retention of the menses, the suspension of other excretions, serous effusions, dropsy and death." He accordingly recommends purgative medicines, until the bowels are well emptied, after which he has recourse to tonics. I have never used purgatives in this disease, nor am I disposed to employ them to the extent recommended by Dr. Hamilton. The costiveness, as well as the amenorrhœa, is, I think, in some instances at least, the consequence and not the cause of the general debility and torpor of the system. There can be no doubt, however, that these effects may, of themselves, contribute to keep up that state of the general system which in the first place produced them. And hence, although purgatives will be proper to remove at least one of these symptoms, namely, constipation, still, our main dependence, in cases unattended by febrile irritation, ought to be placed on the employment of tonics, nourishing diet, and exercise. The same author speaks in very high terms of the employment of purgative medicines, in that variety of vomiting of blood which "attacks females who are from eighteen to thirty years of age." The attack of this variety of hemorrhage "is preceded by great languor and oppression, both about the chest and the præcordia; and by a sense of fullness of the præcordia; by cough, dyspnœa, and sometimes by pain of the breast; by loss of appetite, headache, vertigo, and disturbed sleep; the eye is dull, the countenance is expressive of much distress, the pulse is feeble, and the bowels are constipated." "In this state of impaired health, a particular fit of sickness and nau-

sea is the immediate forerunner of the attack of the vomiting of blood." I have in a few instances known very considerable advantage to result from free purgation in this affection, where it was connected with a loaded state of the bowels. Dr. Hamilton speaks strongly in favor of this practice. "My success," says he, "has been so uniform, that I now lay it down as a certain position, that the proper exhibition of purgative remedies affords sure and effectual means of removing the vomiting of blood which I speak of."

Cathartics have long been considered as important remedies in the cure of dropsies. As I shall, however, have occasion to speak more particularly on this subject when I come to treat of cremor tartar and elaterium, it will be unnecessary to dwell particularly on this point in the present place.

OF THE PARTICULAR CATHARTICS.

RADIX JALAPÆ.—JALAP.

JALAP is the root of the *Ipomœa Jalapa*, a perennial plant, indigenous to Mexico, and some of the West India Islands. It is brought to us either in transverse slices or in pieces of a pyriform shape; these are compact, solid, and heavy; rugous and blackish externally, and of an obscure gray color internally, exhibiting, when divided transversely, a number of concentric circles of a darker hue and more dense structure than the intervening spaces.* When powdered, it has a peculiar and somewhat nauseous odor, and a slightly acrid and sweetish taste. It contains a large proportion of resin, upon which its purgative powers seem almost entirely to depend. It contains also a gum, which, though almost wholly destitute of laxative properties, is said to possess active diuretic powers; some extractive matter, with fecula and salts, also enters into its composition. It appears that a combination of the resinous, gummy, and extractive principles of this root, "is requisite for the production of its *full* cathartic effect;" and hence, proof spirit is its proper menstruum.† The relative pro-

* Jalap is said to be sometimes adulterated with *briony root;* but this may be readily distinguished from jalap by its pale color, its spongy texture, and its greater lightness and bitterness, and by its not burning so readily when held to the flame of a candle.—BURDACH.

† Paris.

portion of resin (with regard to the other component substances) varies considerably in different specimens of the root.*

Jalap is commonly given in the form of powder. From twenty to forty grains may be given at a dose, according to circumstances. In combination with calomel it forms one of the mildest and most effective purges with which we are acquainted. This combination is particularly applicable, when we wish to emulge the biliary organs, to excite the healthy functions of the liver, and to produce prompt and copious alvine evacuations. Hence calomel and jalap in combination are very generally preferred to other purgatives in the treatment of bilious fever, jaundice, hepatitis, &c. The proportion in which these two substances may be combined varies considerably. About ten grains of the former, with fifteen of the latter, form a very suitable mixture.

A combination of jalap and cremor tartar, in the proportion of about twenty-five grains of the former, to forty or sixty of the latter, forms a very useful cathartic in dropsical cases. It powerfully excites the intestinal exhalents, causing them to pour out large quantities of serous fluid, and consequently, producing copious watery evacuations. It is on this account, too, that this combination forms a peculiarly efficacious cathartic for reducing certain local inflammations, such as that of the hip disease, ophthalmia, &c.; for it not only abstracts copiously from the general circulation, but also excites a strong afflux to the intestinal exhalents, and thereby diminishes the determination of the circulation to the parts affected.

Dr. Aiken asserts that fifteen grains of jalap, given in union with two or three grains of ipecacuanha, will purge more promptly and actively than twice this quantity of jalap given by itself. The officinal preparations of this substance are: the *pulvis jalapæ compositus; extract. jalapæ; tinctura jalapæ; tinctura sennæ composita.* The Prussian Pharmacopœia contains a formula for preparing the *sapo jalapinus*, which is said to operate mildly and promptly.† The dose of this preparation is from three to five grains for children, and twelve to twenty grains for an adult. The resin acts powerfully, but is apt to produce violent griping

* The jalap root "is apt to be attacked by worms, which, however, are said to devour the amylaceous or softer parts only, leaving the resin; so that the worm-eaten drug is more powerfully purgative than that which is sound. Out of 397 parts of the former, M. Henry obtained 72 parts of resin, while from an equal quantity of the latter, he procured only 48 parts." *Dispens. of the U. States, &c.*

† This is made by taking equal parts of castile soap and of resin of jalap, and digesting them in a sufficient quantity of alcohol, with a moderate degree of heat, and evaporating to the consistence of a conserve.

pains. Its dose is from gr. x to ℈i. It should be well rubbed up with sugar or vitriolated tartar, in order to obviate its griping effects.

The following is an excellent formula for administering this preparation:

℞.—Resin. jalapæ gr. x—xv;
Vitel. ovi No. ii;
Aq. fontanæ ℥i;
Syrup. zingiberis ℥ss.—M. ft. emuls. To be taken at once.

Richter was in the habit of prescribing it as follows:

℞.—Resin. jalapæ gr. xii;
Pulv. camphoræ,
Submuriat. hydrarg. āā gr. vi;
Mucilag. g. arab. q. s.—M. ut. fiant. pil. ponder ii. Four of these pills are to be taken mornings and evenings, in cases requiring free and repeated purgation.

The *tincture* is now but rarely employed, and might with propriety be altogether rejected from our officinal preparations of this article. It is uncertain in its operation, and always causes very severe griping.

The sapo jalapinus, in combination with other aperient remedies, is said to form a very excellent deobstruent in chronic affections, attended with torpor and a loaded state of the bowels.—Thus—

℞.—Sapon. jalap. ℥iss;
Pulv. rhei ℥i;
Assafœtid. ℥iss;
Tart. antimon. gr. iii;
Mucilag. g. arab. q. s.—M. Divide into two grain pills. From three to six to be taken twice daily.

Vogler recommends a mixture of eighteen grains of this preparation in an ounce and a half of sweet oil as a valuable substitute for castor oil. A tablespoonful of this mixture is to be given every two hours until purging is produced. In the Polyclinic Institute at Berlin, the following combination has been used with much success for the expulsion of tape-worm.

℞.—Terebinth. venetæ ℥i;
Sapon. jalap. ℥ss;
Extr. hyoscyam. gr. vi;
Calomel gr. viii.—M. Ft. pil. pond. gr. ii. Take four pills every three hours.*

* Hufeland's Journal, Bd. 62. St. vi. s. 117.

RHEUM.—RADIX RHEI.—RHUBARB.

The precise species of *rheum*, which affords the rhubarb of commerce, is still a subject of doubt and uncertainty. It does not appear that the plant which furnishes the officinal rhubarb, has ever been seen and botanically examined, in its native place. It is generally admitted, however, that the *rheum palmatum*, and the *R. undulatum*, are the species from which this root, as met with in commerce, is obtained. By the London Pharmacopœia, the *R. palmatum* is recognized as the plant which furnishes the officinal rhubarb. The Dublin Pharmacopœia mentions both the *R. palmatum*, and *R. undulatum*, as the proper medicinal species; and the United States Pharmacopœia refers the drug to the *R. palmatum*, "and other species not particularized."

Whatever may be the final determination as to the particular species of rheum which furnish the officinal rhubarb, it is certain, that at least three varieties of this root are imported into this country—namely, the *Chinese*, the *Russian*, and the *European*.

I. Chinese Rhubarb.—*Rheum Sinense, vel Indicum.* By far the largest proportion of rhubarb imported into the United States, consists of this variety:—It is in oblong, roundish pieces, frequently compressed, or flattened on one or both sides, of an obscure yellow, or ochry color on the external surface, "appearing as if the cortical portion of the root had been removed by scraping, and the surface rendered smooth, and somewhat powdery, by attrition." Its texture is compact and rather firm, and breaks with an uneven, rough, and ragged surface. Its specific gravity is greater than that of the Russian rhubarb. Nearly every piece is perforated with a hole, made for the purpose of suspending the root with a cord, to facilitate the drying. The odor of the Chinese rhubarb is peculiar and slightly aromatic, the taste bitter, perceptibly astringent and gritty when chewed. The finely pulverized root has a pale yellow, inclining to orange color.

The Chinese rhubarb is regarded as somewhat inferior to the Russian. It is, however, sufficiently active and certain in its powers, to supply, without disadvantage, the Russian variety of the root; and as it is much cheaper than the latter, it has of late years, in a great measure, put the Russian rhubarb out of market in this country.

II. Russian Rhubarb.—*Rheum Russicum vel Turcicum.*—The Russian rhubarb is in irregular and somewhat angular pieces, "appearing as if the bark had been shaved off longitudinally by successive strokes of a knife, and a portion of the interior

substance removed with each shaving." The color of the pieces is fresher and of a brighter yellow than that of the Chinese. They are also of a less compact and firm structure, and somewhat lighter, "being cut with less facility, owing to the elasticity of their substance giving way before the knife." The perforations, too, differ from those of the Chinese. They are large in the Russian root, often penetrating only to about the centre of the piece, and evidently made for the purpose of inspection.* In the Chinese root they are small, and pass entirely through the pieces, "and were intended for the passage of a suspending cord." In taste and smell there is scarcely any difference between these two varieties of rhubarb. When powdered, the Russian rhubarb is of a brighter color than the Chinese, and without the orange tinge of the latter. "The greater comparative value of the Russian rhubarb has led to frequent attempts at adulteration, and the pieces of Chinese rhubarb are said to be sometimes cut down and prepared so as to resemble the Russian. Sometimes the worm-eaten pieces are made to resemble the sound, by filling up the holes with a mixture of pulverized rhubarb and mucilage, and covering the whole surface with powder. By removing this the fraud is at once revealed."—*U. S. Dispensatory.*

III. European Rhubarb. — *Rheum Britannicum.* — The rheum palmatum, R. undulatum, and R. compactum, are pretty extensively cultivated in England, France, Germany, and Belgium; and no inconsiderable quantity is annually brought into the market from these sources. The European rhubarb is decidedly inferior, in its purgative powers, to the rhubarb imported from Russia and China. It occurs in oblong pieces, several inches in length, and often not above an inch in thickness, sometimes flattened on one or both sides, and occasionally cylindrical, rather long, and comparatively thin. The European is of a much more ligneous texture than the Asiatic variety, and when pulverized, exhibits a *reddish*-yellow color. Its odor is disagreeable and nauseous; its taste quite astringent, and when chewed it does not give much color to the saliva, nor does it feel gritty between the teeth."—*U. S. Dispensatory.*

According to the analysis of M. Henry, rhubarb contains a peculiar yellow coloring principle, a fixed oil, which, by being subjected to heat, becomes rancid, and is soluble in alcohol and ether, starch, gum, tannin, lignin, oxalate of lime, a minute pro-

* The Rhubarb taken to Russia from Tartary, undergoes a peculiar preparation, in conformity with the stipulations of a contract with the Bucharian merchants, who furnish the supply. The best is selected, and each piece perforated, in order to ascertain whether it is sound in the centre.—*U. S. Dispensatory.* By G. B. Wood, M. D., and Franklin Bache, M. D.

portion of supermalate of lime, sulphate of lime, a salt of potassa and oxide of iron. The white or reddish streaks which run through it, consist almost entirely of sulphate and oxalate of lime. It was supposed to contain a peculiar acid, to which the name of *rheumic* acid was given, but it has been satisfactorily ascertained that this supposed new acid is nothing more than the oxalic acid. Rhubarb has been frequently subjected to minute chemical analysis. Pfaff, and afterwards Caventeau, obtained from it a peculiar principle, to which they gave the name of *rhabarbarin.** This substance appears to be identical or very closely allied to yellow coloring matter of rhubarb obtained by M. Henry. It consists of a dark yellow, or yellowish-brown, hard, shining, opaque mass, of a bitter, harsh, and nauseous taste, and the odor of rhubarb, insoluble in cold, but readily dissolved by hot water, alcohol, and ether. This is, perhaps, the purgative principle of rhubarb. It does not appear to possess any alkaline properties. Nani obtained a *sulphate of rhabarbarin.*† The Chinese rhubarb contains less tannin, resin, and oxalate of lime, but a greater proportion of extractive and gallic acid, than that which comes from Turkey. Out of sixty parts of Turkey rhubarb, twenty-four are taken up by water at the temperature of 212°. By long boiling it loses its cathartic properties, but becomes more astringent and bitter. Alcohol extracts 2·7 parts out of ten. That which comes from China is, however, more soluble. One half of its weight is taken up by boiling water; and alcohol extracts four out of ten parts. "Its habitudes with acids, alkalies, and neutral salts differ likewise from those of the Russian variety."‡ The active properties of rhubarb do not, however, appear to reside wholly in the extractive principles of the root; or more correctly speaking, perhaps, they seem, in part at least, to consist in a volatile principle. This may be inferred from the fact, that the purgative powers of the root diminish very materially by age; more especially when it is suffered to remain exposed for a long time in the pulverized state.

With its cathartic properties rhubarb possesses a considerable degree of astringency. Given in small doses, as from four to ten grains, it acts as a stomachic and gentle tonic. In the dose of from twenty to forty grains, it operates as a mild and pretty active cathartic, but, from its astringency, it is apt to leave the bowels in a costive condition after its operation. From this union of properties, it is evident that it is not well suited to the treatment of inflammatory diseases, nor, indeed, to that of any other com-

* Mat. Med. Bd. iii. s. 23, and Bd. vi. s. 308. Also, Bd. vii. s. 154.

† Bibl. Universelle, June, 1823.

‡ Paris's Pharmacologia.

plaint in which we wish at once to evacuate the contents of the bowels, and to abstract from the general circulation by means of the intestinal exhalents. It has been much recommended in dysentery, and there can be no doubt of its peculiar utility in the advanced stages, or chronic form of this complaint; but in the commencement of the disease, before the inflammation has been considerably moderated by more decisive antiphlogistic measures, rhubarb is not an appropriate cathartic.

On the contrary, however, the very astringency which rhubarb possesses, in common with its cathartic properties, renders it particularly useful in the treatment of diarrhœa, and other diseases connected with a laxity or debility of the intestinal canal. It is evident that much advantage is to be derived in affections of this kind, from a remedy, which, like the present one, at once evacuates the bowels of their vitiated contents, and acts upon them as a gentle tonic.

In the treatment of indigestion, rhubarb is decidedly the most useful purgative we possess. Where, from debility of the digestive organs, much acid is generated in the primæ viæ, rhubarb may be very advantageously exhibited in union with magnesia. In the diseases of infants this medicine has been long regarded as peculiarly beneficial. It is especially useful, when combined with magnesia, in the griping bowel complaints of very young infants. From one to two grains of rhubarb with three or four grains of magnesia, and two or three grains of powdered valerian root, rubbed up with a little cinnamon-water and sugar, forms a most excellent medicine in cases of this kind.

United with aromatics, rhubarb forms a highly useful aperient in atonic gout, attended with uneasy sensation and debility of the stomach. Warner's cordial* has been used with much advantage for this purpose. When taken internally, its coloring matter passes rapidly through the circulation, and is soon conspicuously manifested in the urine. Its purgative effects are considerably enhanced by uniting it with neutral salts; "the super-sulphate of potass forms a very useful adjunct, and its acidulous taste completely covers that of the rhubarb."

Externally, powdered rhubarb is sometimes employed as an application to ulcers, for the purpose of promoting granulations. It is particularly recommended by Homet as an application to old and indolent ulcers; and some have advised it as a useful stimulant to chronic venereal sores. If it produces considerable pain, in ulcers of this kind, a few grains of powdered opium

* Rhubarb bruised ℥, senna ℥ss, saffron ʒi, powdered liquorice ʒiv, raisins pounded ℔i, brandy ℔iii. Digest for a week and strain.

† Observations on the Practical Treatment of Ulcers, &c.

should be mixed with it. I have derived much benefit from sprinkling indolent chancres with a powder composed of about a drachm of very finely powdered rhubarb with twenty grains of calomel and ten grains of powdered opium.*

The officinal preparations of rhubarb are:—1. *Tinctura rhæi aquosa.* This preparation is not introduced into the English and American Pharmacopœias, although well deserving a place among the preparations of this article. According to the Prussian Pharmacopœia, it is made by pouring twelve ounces of boiling water on one ounce and a half of the rhubarb with three drachms of carbonate of potash, and digesting twelve hours. To ten ounces of the strained infusion, two ounces of cinnamon-water are to be added. Simply as a purgative, this preparation does not possess much value, but in the colic and griping of infants from acidity in the primæ viæ, it is a most excellent remedy. From ten to twenty drops may be given to an infant. 2. *Tinct. rhæi.* 3. *Tinct. rhæi et aloes.* This is an excellent preparation in chronic hysteria attended with weakness of the digestive powers, flatulency, and torpor of the bowels. It may also be used with much advantage in amenorrhœa, attended with a sluggish state of the system, and intestinal torpor. The formula is introduced into the American Pharmacopœia. A tablespoonful should be taken two or three times daily. 4. *Tinct. rhæi et gentianæ* (Am. Pharm.), is valuable in indigestion from mere gastric debility. 5. *Syrupus rhæi.* 6. *Pilulæ rhæi composit.* (Ph. Edin.) It may be advantageously used in cases of amenorrhœa, attended with general relaxation and torpor of the bowels.

Formulæ.

℞.—Rad. rhæi ʒii.

Rasur. liq. quass. ʒss.—Digest for twelve hours with ʒv of boiling water. Strain, and add tinct. aromat. ʒi, syrup. cort. aurant. ʒss.—M. A tablespoonful of this infusion may be taken every three hours, in cases attended with much debility and relaxation, where it may be thought necessary to keep up a moderate action of the bowels, and to increase the tone of the stomach.

℞.—Rad. rhæi ʒiss.

Rad. ipecac. ʒss.—Boil them in three ounces of water about fifteen minutes, then strain, and add pulv. gum Arab. ʒiii.—M. A tablespoonful of this decoction, taken every two or three hours, will often prove highly serviceable in mild cases of dysentery. (Jahn, Richter.)

* *Incompatible substances.* "The stronger acids; the sulphates of iron and zinc; nitrate of silver; tartarized antimony; acetate of lead; oxymuriate of mercury; and the infusions of cusparia, cinchona, catechu, galls, and of some other astringent vegetables; the alkalies deepen the color, but produce no decomposition."

℞.—Tartrate of potash,
P. cort. aurant.,
P. rad. rhæi,
P. sem. fœnicul., āā ℥ii,
Ol. cajeput gtt. viii.—M. A teaspoonful of this mixture is an excellent remedy in habitual torpor of the bowels. This is the *solamen hypochondriacum* of Klein.

FOLIA SENNA.—SENNA LEAVES.

According to the most recent authentic observations, this drug is furnished by at least three different species of the genus Cassia, namely, *C. acutifolia*, *C. obovata*, and *C. elongata*. The leaflets of the *C. acutifolia* are from half an inch to an inch in length, lancet-shaped, very acute, distinctly nerved, oblique at the base, and of a yellowish-green color. The pods are about an inch long, and half an inch broad, flat, elliptical, membranous, grayish-brown, very little or not at all curved, containing six or seven firm, heart-shaped, grayish seeds, in a corresponding number of distinct cells. The leaflets of the *Cassia obovata* are obovate, very obtuse, and in other respects similar to those of the C. acutifolia. The pods are curved, or kidney-shaped, very much compressed, of a greenish-brown color, containing from eight to ten seeds. This species is indigenous to Syria, Egypt, and Senegal. The leaflets of the *Cassia elongata* are long, varying from an inch to twenty lines in length, very acute, thin, oblique at the base, with very short and rather thick foot-stalks. The pods are thin, smooth, shining, slightly curved; very obtuse at the summit, with small mucronate points, and of a greenish-olive color along the margin, and dark in the centre.

In commerce, several varieties of senna occur, the most important of which are the *Alexandria senna*, the *Tripoli senna*, and the *India senna*.

I. The first of these varieties (*Alexandrian*), is imported, as its name implies, from Alexandria, in Egypt, and consists principally of the cassia acutifolia, mixed, sparingly, with the leaflets of the cassia obovata, and frequently also with the leaves of the *Cynanchum oleæfolium*, or "according to M. Royer's inquiries, the proportions in which these three constituents of Alexandria senna are mixed together, are five parts of the C. acutifolia, three of the C. obovata, and two of cynanchum. Hence in examining a parcel of what is known in commerce as Alexandria senna, we find, 1. A large proportion of very acute, lance-shaped leaflets, always less than an inch in length, (*C. acutifolia.*) 2. A less proportion of obovate leaflets, having a rounded and very obtuse

summit, gradually diminishing its breadth towards the foot-stalks (*C. obovata*). 3. A small proportion of long, firm, and rather thick leaflets, without any lateral nerves on their under surface, of a light color, and a regular or equal base." These are the leaves of the *Cynanchum oleæfolium*, and as they are exceedingly harsh and irritating in their action on the bowels, they should be regarded as an adulteration. They may always be readily distinguished from the cassia leaflets, by the absence of lateral nerves, and the regularity of their base; in both of which circumstances they differ, very obviously, from the genuine senna leaflets, "which, from whatever species derived, are always marked by *obliquity* of base, one side being inserted in the petiole, at a point somewhat lower than the other, and at a different angle." (*Dispensat. of the U. States.*)

II. The *Tripoli senna.* This is generally regarded as the least valuable variety of senna brought to this country. This opinion does not appear to be well founded, for the *genuine* Tripoli senna "consists exclusively of the *Cassia acutifolia*, containing neither the obovate senna nor the leaves of the cynanchum, and is generally free even from the pods of the first-mentioned species. The leaflets, however, are much broken up, and it is probably on this account that this variety is less esteemed than the Alexandrian."

III. The *Indian senna;* known also by the name of *Mocha* senna, contains a much larger proportion of pods and leaf-stalks than the two preceding varieties. It does not appear to be a mixture of different species, for all the leaflets it contains are alike in shape and appearance. They are longer and narrower than those of the varieties already mentioned, being derived from the *Cassia elongata.*

The active principles of senna are completely extracted both by water and alcohol. "The leaves yield about one-third of their weight to boiling water, one pint of which is requisite to exhaust the strength of an ounce of the leaves." According to an interesting analysis of senna, made by M. Bouillon Lagrange, it appears, 1. That the watery extract of senna is almost entirely soluble in alcohol, and that the part thus soluble is not a resin, as has been supposed, but a substance which requires simply the addition of a certain portion of oxygen, to convert it into a matter which has all the characteristics of resin. 2. That part soluble in water contains sulphate of potass, potass, carbonate of lime, magnesia, silex, &c., together with that substance which I have just said is connected with a matter possessing the character of resin by uniting with a portion of oxygen, and to which senna seems to owe its purgative qualities. It appears, also, that this peculiar substance has a very strong affinity for oxygen; and

hence we see the propriety of the caution given by Dr. Paris, that the infusion of senna should never be suffered to stand long before it is taken; "since, by simple exposure to the air, for only a few hours, in consequence of the powerful affinity of its extractive matter for oxygen, a yellow precipitate takes place, and the infusion loses its purgative quality." "In preparing it, therefore," he adds, "we see the necessity of conducting the process in *covered* vessels, and of making only such a portion as may be required for immediate use." The senna has been more recently subjected to a minute chemical examination by Lassaigne and Fenuelle.* From this analysis it appears that the senna leaves contain, 1. A peculiar principle to which the name of *cathartin* has been given. 2. *Chlorophylle*, or the principle that gives to vegetables their green color. 3. A fixed oil. 4. A small portion of an ethereal or volatile oil. 5. Albumen. 6. A yellow coloring matter. 7. Mucilage. 8. Salts of the vegetable acids; that is, the malate and tartrate of lime, and acetate of potassa. 9. Mineral salts. The most important of these constituents is the *cathartin*. This substance does not crystallize. It is of a reddish-yellow color, and has a peculiar smell, and a bitter and nauseous taste. It is soluble in alcohol and water, in all proportions, but insoluble in ether. It attracts the humidity of the atmosphere, and becomes moist when exposed to the open air. It is powerfully cathartic, and doubtless constitutes the active purgative principle of senna.

Senna is hardly ever employed as a cathartic, except in the form of an infusion. In order to divest it of its griping quality, which it possesses to a very considerable degree, it is commonly mixed with other substances, such as manna, coriander, fennel, or anise seeds. For this purpose, however, the best adjuncts are soluble tartar and alkaline salts, which have the power "of increasing the solubility of its oxidized extractive." A decoction of guaiacum and vegetable bitters are said to increase its powers and to render its operation milder.†‡

* Richter's Specielle Arzneimittellehre, Bd. 3. 2. p. 326.

† Paris's Pharmacologia.

‡ The *infusum sennæ limoniatum* is a very convenient mode of exhibiting this medicine to children. It is made by pouring six ounces of boiling water upon ℥ss of fol. senna, ʒii lemon peel, and ʒii lemon juice.

The *infusum laxativum viennense*, is also an excellent preparation. It is made thus: folior. sennæ ʒii, cremor tart. ʒiss, pulv. rhei ʒi, sem. coriander ʒiss, mannæ ℥i, aquæ ferventis ℥vi. Digere der 4t. horas.

Selway's prepared essence of senna.—"This is a concentrated infusion of senna in combination with an alkali. It is admirably adapted for domestic use."—PARIS.

It appears to be particularly well adapted as a purgative in cases attended with torpor of the bowels, unconnected with irritation or phlogosis of the mucous membrane of the alimentary canal; and where we desire to make a strong impression on the intestinal nerves, as in cases of hemiplegia, apoplexia, &c. In individuals of an irritable habit, where there is a predisposition to bowel complaints; and in general in all affections attended with an excited state of the intestinal canal, this purgative must be avoided. It may be beneficially used in those cases of general depression which arise from irritating matters in the bowels, and which soon after parturition sometimes give rise to symptoms resembling puerperal fever.

It is observed by Alibert, on the authority of M. Bouillon Lagrange, that the powdered senna is apt to undergo alteration or decomposition when suffered to remain exposed to a humid atmosphere. In such a situation, it becomes covered with a kind of pellicle, or mouldiness, which contains a small portion of potass. The powder, however, is but very seldom employed, except in the form of an electuary in combination with other purgatives.

Various substances form precipitates with the infusion of senna. The infusion of galls, of the yellow cinchona, and the solution of subacetate of lead, precipitate the *cathartin*. The infusion is also disturbed by tartarized antimony, and the acetate of lead, but they do not precipitate the cathartin. Strong acids, lime-water, the nitrate of silver, corrosive sublimate, and some other substances, cause more or less disturbance in the senna infusion, but it does not appear that they alter or weaken its purgative properties.

The officinal preparations are: 1. *Electuarium lenitivum*, (*confectio sennæ*,) an excellent composition in cases of habitual costiveness. 2. *Tinctura sennæ*. 3. *Tinctura sennæ compositum*, of the London Pharm.

Formula.

℞.—Electuar. lenitiv. ℥vi—x;
Acid. tartar. ℈ii—℈iii;
Sacchar. alb. ℥ii;
Aq. flor. aurant. ℥ii;
Æther acet. ℈ss. M. Of this a tablespoonful may be taken every hour or two. It is a mild and most excellent laxative, and may be given with peculiar advantage in weak and irritable habits. I have employed it much in practice, and esteem it particularly valuable in weak and nervous persons affected with torpor of the bowels and hemorrhois. It is strongly recommended in cases of this kind by Heim.*

* Rust's Magazine, Bd. 3. p. 308.

GAMBOGIA.—GAMBOGE.

This gummy-resinous substance is, by the majority of writers, mentioned as the product of the *Stalagmitis cambogioides*, a tree of middling size growing abundantly in the kingdom of Siam, and in Ceylon. Dr. Duncan, however, asserts that a specimen of the inspissated juice of the stalagmitis, which was sent to him from India, did not agree, in its properties, with the genuine officinal drug. The opinion of Persvan, De Candolle, and Richard, that the gamboge of commerce is derived from the *Garcinia cambogia*, (Cambogia gutta of Linn.,) is satisfactorily contradicted by the testimony of Dr. White, who, it appears, was well acquainted with the garcinia cambogia. "On the whole, it must be admitted that we are uncertain, not only as to the precise tree which affords the officinal gamboge, but also whether it is derived from any one tree exclusively, or from several."

Gamboge consists of small, irregular solid lumps, of saffron yellow color, breaking with a shining or vitreous fracture. When moistened, it assumes a beautiful bright yellow color. It is destitute of odor, but has a slightly acrid taste. It consists of one portion of gum, four of a very brittle resinous matter, and a portion of a peculiar saponaceous principle. Neither water nor alcohol dissolves it entirely; unless potash be added to the water, or ammonia to the alcohol. In a solution of caustic potash it is readily and wholly dissolved; the solution has a beautiful red color, and may be mixed with water and alcohol without becoming turbid.*

Gamboge acts very powerfully both as a cathartic and an emetic, and is, in consequence, condemned by some, as apt to excite violent and dangerous hypercatharsis and vomiting. Others, on the contrary, speak strongly in its favor, and represent it as a mild, certain, and safe cathartic. Dr. Ferriar, especially, recommends it as one of the gentlest and most certain of our purgative remedies. "After a long and extensive experience," says he, "of the qualities of gamboge, I can recommend it as one of the gentlest, most certain, and least nauseous laxatives in the materia medica. Being nearly free from either smell or taste, it is particularly well adapted to the management of children, with whom its anthelmintic power is likewise valuable."† It seems, however, to be generally allowed, that its action is too powerful for the ordinary purposes of purgative remedies; and, unless as an

* Pfaff, Mat. Med.

† Medical Histories, p. 270. Philad. edit. 1816.

adjunct to other substances of this class, it is at present but seldom employed in practice.

Gamboge has been a good deal employed in dropsy. By proper management, it is undoubtedly a medicine of considerable value in this disease. It is particularly a useful hydragogue in ascites, attended with a sluggish state of the system. In cases accompanied with a general irritable and phlogistic habit, it rarely operates favorably; and it is particularly to be avoided where there is any evidence of the existence of high irritation of the mucous membrane of the alimentary canal. In ascites, it is commonly given in union with cream of tartar, in the proportiom of about two grains of the former to half an ounce of the latter, for a dose. Large watery stools, and an increase of urine, are generally produced by the operation of such a dose. Dr. Ferriar relates several remarkable instances of the efficacy of gamboge in dropsy, given in union with the nitrous or vitriolic ether. He directs five grains of gamboge with two drachms of spiritus ætheris vitriolici, in a draught, two or three times a week. This composition acts as a gentle purgative, and considerably increases the urine. "When there is imminent danger of suffocation," says Dr. Ferriar, "from the quantity of water effused in hydrothorax, I have frequently given immediate relief by the following purgative draught.* A draught of this kind may be given twice or thrice a week, in such cases, while the cream of tartar and diuretic drops† are employed on the intermediate days." An excellent mode of giving this article in dropsical and other affections, is, a solution of it in the *liquor potass. carbonici*, in the proportion of a scruple of the gamboge to half an ounce of the latter. Of this solution from thirty to forty drops may be given three or four times daily.

Gamboge has also been frequently employed with advantage for the expulsion of intestinal worms. It has been especially recommended against the tape-worm, and as an active cathartic, either after the exhibition of more direct anthelmintics, or in-

* ℞.—Cambog. gr. iv;
Sp. æther. nitros. ʒi;
Tinct. senn. ʒii;
Syrup. rhamni,
Aq. menth., āā ℥ss.—Misce.

† ℞.—Oxymel. colchici,
Oxymel. scill.,
Tinct. nicotian.,
Sp. æther. nitros., āā p. æ.—M.
Capiat cochleare parvulum, ex aquæ pauxillo, quater in die.

dependent of such remedies; there can be no doubt of its occasional beneficial operation in such cases.

Given in minute doses, so as not to produce either vomiting or purging, this remedy is said to be serviceable as a stimulant, in chronic rheumatism, asthma, and particularly in exciting the activity of the portal circulation.*

Its great solubility increases its tendency to act upon the stomach and to excite vomiting. This effect is accordingly much diminished by giving it in combination with other substances, which lessen its solubility, and hence the addition of a portion of aloes to it (as in the *pil. cambogiæ compos.*) renders it a very mild and unirritating purgative.

To obviate its tendency to produce vomiting, Dr. Cullen prescribed it in small doses, and repeated it at short intervals until purging was produced. Dr. Ferriar, in his Medical Histories, says: "A very commodious form for exhibiting gamboge, is a solution in distilled water, in the proportion of half a grain to half an ounce of water. A tablespoonful may be given to an adult every hour till it operates. A teaspoonful of this solution, given in the same way, is a dose for a child under twelve years of age. When given in this manner, doses of seven or eight grains have been found necessary to move the bowels, and it has proved strongly diuretic."

Formulæ.

℞.—G. cambogiæ ℈i;
G. Arab. ʒi;
Solve in aq. fontanæ ℥iv;
Adde potassæ carbonat. ʒss;
Syrup. limonis ʒss.—M. Take a tablespoonful every two or three hours.

℞.—G. cambogiæ,
Sulph. aurant. antimonii,
Ext. scillæ,
Ext. hyoscyam., āā ℈i.—M. Divide into two grain pills. Take one pill every three hours, as a hydragogue in dropsical affections.

The *sapo* G. *guttæ* of the Germans is said to be a very excellent hydragogue preparation. It is made by boiling six ounces of gamboge with three drachms of caustic potash in nine ounces of water, until they begin to unite; and then adding two and a half drachms more of caustic potash dissolved in four ounces of water, and simmering the whole until it has acquired the consistence of a soap. From twelve to twenty grains of this mass is said to operate copiously, without exciting the severe tormina, otherwise so apt to be produced by gamboge.

* Burdach's Arzneimittellehre, Bd. iii. s. 66.

ALOES EXTRACTUM.—ALOES.

THREE varieties of aloes are imported into this country, namely, the *Cape*, the *Socotrine*, and the *Hepatic*.

I. *Cape Aloes.* By far the greatest proportion of aloes met with in the markets of this country is of this variety. It has, not unfrequently, been confounded with the socotrine, but it differs, very obviously, from this variety, both in appearance and sensible properties. Externally it is of a yellowish color; but when broken, it presents a smooth and glassy surface of a *very dark olive* color, approaching to black; the edges of the fragments being translucent when held up to the light. The powder is "of a fine greenish yellow color. It has a strong and disagreeable odor, without the slightest mixture of aromatic." This variety of aloes "is very brittle, and readily reduced to powder; but in very hot weather it is apt to become somewhat soft and tenacious."

II. *Socotrine aloes.* This variety of aloes has a *reddish-brown* color, with a slight admixture of yellow. It breaks with a smooth conchoidal fracture, with sharp and translucent edges. When powdered it is of a bright yellow. Its bitterness is accompanied with a very perceptible aromatic flavor. It softens by the heat of the hand, and in warm weather is always somewhat tenacious. The socotrine is generally regarded as the most valuable variety of aloes; but it is very doubtful whether, in any respect, it is superior to the Cape aloes.

III. *Hepatic aloes.* This variety is produced in the West Indies and Spain. It is of a reddish-brown color, but darker and less glossy than the socotrine. Its odor is very unpleasant, without the slightest aroma; and its intense bitterness is accompanied with a peculiar nauseous taste. It breaks with a somewhat uneven and splintery fracture, and the edges of the fragments are but very imperfectly translucent. At a temperature of about 96° it softens and becomes adhesive. When pulverized, it is of an obscure olive-yellow color. It is but seldom brought to this country, and is universally and justly regarded as decidedly inferior to the two preceding varieties.

According to the analysis of Tromsdorff, socotrine aloes consists of twenty-five parts of resin and seventy-five of a saponaceous extractive matter, soluble both in alcohol and in water; a slight trace of gallic acid may also be detected in it. This saponaceous extract is intensely bitter, and possesses a faint odor, resembling in some degree that of saffron. The resinous matter is not very bitter, and possesses but feeble powers as a purgative. Mr. Braconnot "conceives aloes to be a substance *sui generis*," which

he terms "*bitter resin.*" Berzelius considers the resinous matter obtained by Tromsdorff, as nothing more than extractive, changed by the action of air. He calls this resinous substance *apotheme.*

Aloes is but very slowly dissolved by cold water. Boiling water dissolves it readily; but, on cooling, the resinous portion or apotheme of Berzelius, is precipitated. Long boiling deprives it entirely of its purgative properties, by converting the extractive into the insoluble apotheme. Its appropriate solvent is proof spirit. The solubility of aloes is increased "by alkaline salts and soaps; but, by such a combination, aloes undergoes a material change in its medicinal properties; the bitterness is diminished, its purgative effects impaired, and it ceases to operate specifically upon the large intestines, a fact so far valuable as it enables us in certain cases to obviate its irritating action upon the rectum."*

Aloes is a slow, stimulating cathartic, exciting a sensation of warmth in the stomach and bowels, and directing its operation more especially upon the lower portion of the intestinal canal. This is supposed to depend on the slowness with which it is dissolved; in consequence of which it passes through the stomach and small intestines before it has had time to dissolve and act upon them. Being, however, at last dissolved in its progress through the large intestines, it acts upon this portion of the bowels with considerable force, and causes copious feculent evacuations. However plausible this explanation of the circumstances in question may be, its correctness is rendered extremely doubtful by the fact, that even when administered in a fluid or dissolved state, aloes acts chiefly upon the lower portion of the intestinal canal. This circumstance would, therefore, appear to depend rather on the peculiar nature of its purgative properties than on the degree of its solubility. Dr. Cullen observes, that aloes evacuates the bowels simply by exciting the peristaltic action of the intestines, without increasing materially the intestinal secretions, as is evident from the state of the evacuations, which are hardly ever liquid.

In consequence of this tendency to act more particularly on the rectum, and thereby create an increased flow of blood to the pelvic viscera, aloes is a good deal employed to promote the secretion of the menses, for which, indeed, it seems to be well adapted in cold, phlegmatic, and costive habits. This very tendency, however, renders aloes an improper aperient in persons subject to hemorrhoidal tumors, or affected with any other disease of the rectum.

From its acting in small doses as a slow aperient, it is well suited to obviate habitual costiveness. When employed with this intention, it is necessary to avoid a strong operation, as it is

* Paris's Pharmacologia.

apt, when it acts fully, to leave the bowels in a dry and costive condition. Given in small doses, as from one to two grains, it acts as a tonic upon the alimentary canal; promotes digestion; and, in relaxed and torpid habits, keeps up the regular peristaltic action of the intestines; and it is only when it produces this slow but natural action of the bowels, that it can be employed with propriety in constitutional costiveness. It should be recollected, however, that the habitual use of this aperient has a tendency to produce congestion in the veins of the pelvic viscera, and thereby to cause hemorrhoidal tumors and discharges. The aperient operation of aloes is not proportionate to the size of the dose. Four or five grains will often produce nearly the same opening effect as ten or fifteen grains. It is, however, almost always very slow in its aperient effects. It seldom operates before the expiration of five or six hours after it is taken, and often not until after the lapse of ten or twelve hours. In an uncombined state, indeed, it hardly ever produces large evacuations, whether it be given in a small or large dose. In union with other articles, however, it furnishes us with several very useful preparations, viz: pulv. aloes compos. L.; pil. aloes cum myrrha, L. E. D.; pil. aloes compos.; pil. aloes cum assafetid., E.; pil. aloes cum colocynth., E.; pil. scammon. cum aloe, D.; extract. colocynth. compos., L. D.; tinct. aloes comp., L. E. D.; tinct. aloes ætherea, E.; extract. aloes aquosum.

Individuals of a sluggish and irritable habit, with a slow and languid state of the circulation, generally bear this aperient much better than persons of sanguine and irritable temperaments. In subjects of this latter habit, its operation is apt to leave a dry and irritated state of the colon and rectum, with protracted constipation.

Externally, aloes has been used in weakness of the eyes, as well as in opacities of the cornea. Janin speaks in the highest terms of the following collyrium: ℞. vin. alb. ℔ i; aloes; tutiæ præp. croci metallor, āā ʒi. Put them into a bottle, and digest in the sun for two months. Reil says that this tincture, diluted with an equal part of rose water, forms an excellent wash for weakness of the eyes attended with a profuse flow of tears. Beer recommends a salve composed of ten grains of sulphate of zinc, the same quantity of the acetate of copper and burnt alum, with eight grains of aloes and half an ounce of honey, as a very useful application for the removal of opacities of the cornea. It is to be applied with a small and very soft pencil to the opaque part of the cornea.

Formulæ.

Dinner Pills.—Lady Webster's, or Lady Crespigny's pills.—These popular pills are the "*pilulæ stomachichæ, pilulæ ante cibum*" of the Codex.

Medicamentarius Parisiensis, edito quinto, A. D. 1758: viz. ℞. aloes optimæ ʒiv; mastiches et rosarum rubrarum, āā ʒii; syrupi de absinthio q. s., ut fiat massa: the mass is to be divided into pills of three grains each. The operation of this pill is to produce a copious and bulky evacuation, and in this respect experience has fully established its value.—*Paris's Pharmacologia.*

℞.—Extract. glycyrrh. ℥ss; carbonat. potassæ ʒii; aloes; myrrhæ crocci, āā ʒi. Boil them in a pint of water down to twelve ounces; then strain and add tinct. cardamomi compos. ℥iv. Brande says that from four to six drachms of this decoction, mixed with an equal part of some aromatic water, and taken every other morning, is a most excellent tonic aperient in debility of the digestive organs attended with acidity.

SCAMMONIA.—SCAMMONY.

This substance is the inspissated juice of the root of the *Convolvulus scammonia*, a perennial plant, growing abundantly in the mountainous parts of western Asia. It comes to us from Smyrna and Aleppo in blackish gray cakes. That which is imported from the latter place is purer and better than the Smyrna scammony. It comes to us in large irregular masses, of a dark ash, or olive color internally, and when recently broken, of a lighter ash, inclining to yellow, internally. Its structure is generally somewhat porous or cavernous, and occasionally nearly compact. It is readily pulverized, yielding a light ash-colored powder. When triturated with water, it forms a slightly greenish milky fluid. It has a bitter sub-acrid taste, and a peculiar disagreeable odor, said to resemble old cheese. Aleppo scammony, according to the analysis of Buillon Lagrange, contains sixty parts of resin, two of extractive, three of gum, and thirty-five of insoluble matter. That which comes from Smyrna contains less resin, but more gum and extractive. It is in thin flat cakes of a darker color, and more compact structure, than the preceding variety. Its fracture is dull and granular; its taste bitter and acrid, and when rubbed with water, it forms an opaque dirty white fluid. Proof-spirit is its best menstruum; it dissolves all except its impurities. Water dissolves about one-fourth, and alcohol two-thirds.

Scammony was one of the purgatives employed by the ancients. A decoction of the root of the plant which yields it was used by Hippocrates; and it is said to be an excellent purgative when given in this way, procuring free evacuations, without occasioning griping or any manner of sickness.* During the mid-

* Dr. Alexander Russell, in a letter to Dr. Fothergill. See Medical Observations and Inquiries, vol. i. p. 13.

dle ages it was much employed as a cathartic, under the name of *diagrydium*.

Scammony is a powerful purgative. The accounts given of its effects by different writers are, however, very discrepant. Some represent it as mild and perfectly safe; whilst others mention it as a violent and dangerous cathartic.

Orfila found ulcers in the stomachs of animals that had been killed by scammony. These differences in the action of this remedy are, however, supposed "to be entirely owing to the different circumstances of the patient, and not to any hurtful quality or irregularity of operation of the medicine; where the intestines are lined with an excessive load of mucus, the scammony passes through without acting upon them; but where the natural mucus is deficient, a small dose of this or any other resinous cathartic, irritates and inflames."*

Scammony enters into the composition of many of the purgative remedies that have been recommended against worms. It enters also into several useful officinal preparations; such as the *confect. scammon.*, L. D.; pulv. scammon. comp., L. E.; extract. colocynth. comp., L.; pulv. sennæ comp., L.

A very good mode of exhibiting scammony is to triturate it with sulphate of potass, sugar, or almonds. Given in this way, it operates mildly, and with considerable promptness. It may also be very conveniently exhibited by being dissolved in a strong infusion of liquorice, and poured off from the feces. The dose is from three to fifteen grains.† Much was formerly said of a preparation into which scammony enters as a chief ingredient, and known by the name of *Count Warwick's Powder*, or pulv. detritius. It consists of a mixture of sulphuretted scammony, diaphoretic antimony, and cream of tartar. Ramazzini, Baglivi, Van Swieten, and Werlhoff, recommended it as a peculiarly efficacious purgative in intermittent fevers.

Formulæ.

℞.—Aloes. spicat. ℈i;
G. scammon. gr. xii;
Extract. rhei ℈ii;
Pulv. capsici gr. vi.—M. To be made into sixteen pills. Two may be taken on going to bed.

* Dr. Andrew Duncan's Dispensatory.

† Dr. Paris says, "that there is a compound bearing the name of scammony to be met with in the market which is altogether factitious, consisting of jalap, senna, manna, gamboge, and ivory-black. Good scammony ought to be friable, and when wetted with the finger, it should lactify or become milky; and the powder should manifest its characteristic odor, which has been compared to that of old ewe-milk cheese."—*Pharmacologia*.

℞.—G. scammon. gr. v;
Pulv. rhei gr. xv;
Sub. carbonat. ammon. gr. v.—M. To be taken at once.

℞.—Lactis. amygdalar. dulc. ℥iv;
Resin. jalapæ gr. viii;
Sacch. alb. ℥vi;
G. scammon. gr. vi.—M. Solve resinam jalapæ in ovi vitello, misce scammon. et sacchar. dein adde lac amygdal. (Alibert.)

COLOCYNTHIDIS PULPA.

This is the medullary or pulpy part of the fruit of the *Cucumis colocynthis*, an annual cucurbitaceous plant, growing in abundance in Syria, Arabia, and also in some parts of Spain.* The seeds appear to be wholly destitute of active properties, and are employed as an article of food in northern Africa. According to the analysis of MM. Edwards and Vavaseur, the pulp of colocynth contains a peculiar bitter principle, to which the name *colocynthin* has been given; also a resinous substance insoluble in ether, a fixed oil, extractive matter, gum, and various salts. "The infusion of colocynth, made with boiling water, has a golden-yellow color, and becomes gelatinous on cooling."

This is one of the most ancient purgatives employed in practice at the present day. The Greek and Arabian physicians mention it in their writings as a powerful and valuable cathartic.

It is now but seldom administered in an uncombined form, on account of the great violence of its operation. It is apt to occasion severe griping; and when given in very large doses, seldom fails to produce vomiting, tenesmus, and other manifestations of high gastro-intestinal irritation. It appears to possess a particular tendency to act upon and irritate the mucous membrane of the lower portion of the intestinal canal. Orfila says that he uniformly found the rectum in a state of high inflammation, and gangrenous, in the animals which he destroyed with this article. As a hydragogue, however, it is still occasionally given in dropsical cases; in one instance of which, I have myself prescribed it with great advantage. Along with its very active purgative powers, colocynth possesses also a considerable tendency to excite the action of the kidneys. Bang recommends a decoction of it as a good remedy in dropsy; and Hufeland considers it as the most effectual diuretic we possess, in persons of a cold and slug-

* Dr. Paris observes that "when the fruit is larger than a St. Michael's orange, and has black, acute pointed seeds, it is not good."

gish habit of body. His mode of prescribing it for this purpose is, to boil two drachms of the colocynth in a quart of beer, down to a pint, of which one or two tablespoonfuls are to be taken every day.*

This substance has also been recommended in small doses, in paralysis of the lower extremities, and in herpetic eruptions. It has been particularly praised as a remedy in paralysis of the bladder. Heim, a German writer, speaks very favorably of the *tincture of colocynth*, in union with tinctura antimonii saponata, in the proportion of twenty drops of the former to sixty of the latter every three hours, in cutaneous affections.† Christien asserts (*Iatroleptik*) that he has found frictions with the tincture and infusion of this article of especial service in melancholia, and other forms of torpid mania. The tincture has also been used with much benefit in the chronic nervous affections, particularly in such as are connected with a torpid state of the catamenial function. (Dalberg.)

Colocynth has been a good deal employed in coma and apoplexy; and, as the beneficial effects of cathartics in these diseases depend, perhaps, entirely on the afflux of blood which they occasion from the head to the intestinal canal, there can be no doubt that a remedy which produces such prompt and strong impressions on the bowels, and which, therefore, procures such copious watery evacuations as the present one, is well calculated to prove beneficial in affections of this kind.

The officinal preparations are: *extractum colocynthidis*, L.; *extract. colocynth. compos.*, L. and D.; *pilulæ aloes cum colocynth.*, D.; *tinct. colocynth.*, Pharm. Borus. Bavar.

The compound extract of colocynth is a very useful preparation. In combination with calomel this extract forms one of the most effectual, and, at the same time, mildest purgatives with which I am acquainted. In cases where we wish at once to evacuate the bowels gently, but copiously, and to correct the functions of the biliary organs, I have found the pill recommended by Dr. James Johnson a most valuable medicine.

The dose of the compound extract of colocynth is from ten to fifteen grains. The colocynth, in substance, is given in doses of from five to ten grains.

The subacetate and acetate of lead, the nitrate of silver, sulphate of iron, and the fixed alkalies, disturb its infusion.

* Journal, B. v. p. 65.

† Kölphin über die Würkung der Tinctura Colocynthidis. See Hufeland's Jour. of Pract. Medicine, vol. ii. No. iii. p. 4.

Formulæ.

℞.—Extract. colocynth. comp. ʒi;
Submuriat. hydrarg. gr. xv;
Antim. tart. gr. i;
Olei carui gtt. v.—M. In pilulas 24 divid.
Take one, two or three.

℞.—Tinct. colocynth. ʒss;
Ol. ricini ʒiss.—M. Heim asserts that he has derived great benefit from this mixture, applied by frictions to the abdomen, in children affected with scrofulous swellings.

The tincture, according to the Prussian Pharmacopœia, is made by digesting one ounce of the colocynth with a drachm of *anise seed*, in a pound of rectified alcohol.

ELATERIUM.

This substance is obtained from the fruit of the *Momordica elaterium*, a cucurbitaceous plant, growing wild in the southern parts of Europe. The fruit of this plant bears a very strong resemblance to the common garden cucumber; differing from it merely in point of size. "When full grown it is from an inch to an inch and a half in length, and of proportionate thickness. The seeds, which, when fully ripe, are of a *black* color, are lodged in a light green pulp, the interstices of which contain from half a drachm to a drachm of nearly limpid fluid." This juice, when first collected, is perfectly limpid. On standing a few hours, it first becomes turbid, and then gradually lets fall a sediment, which, when slowly dried, without being exposed to a strong light, has a yellowish-white color, with a faint shade of green. This is the pure *elaterium;* a substance which is decidedly the most powerful cathartic we possess. Its taste is acrid and slightly bitter. It appears to be entirely insoluble in water, whether hot or cold. That which is obtained from the spontaneous deposition of the juice, is almost wholly soluble in alcohol; whilst, of that which is commonly met with in the shops, not more than one-half, and sometimes not above a fourth part is dissolved by alcohol. That part of it which is left undissolved, appears to possess no medicinal powers whatever. By treating the alcoholic extract of elaterium with boiling distilled water, Dr. Paris obtained a substance which "had the property of purging in very minute doses, while the remaining portion of elaterium was inactive." To this substance he gave the name of *elatin*, supposing it to be the active principle of elaterium. More recently, Mr. Hennel, of London, obtained a crystallizable substance, which is believed to be the true purgative principle of the elaterium—the elatin of Dr. Paris

being a combination of this substance and chlorophylle, or the green coloring matter of vegetables. The name of *elaterin* has been given to this purgative principle of elaterium. According to Mr. Hennel's analysis, one hundred parts of elaterium consist of forty-four parts of *elaterin*, seventeen of a green resinous substance (or, as has been supposed, *chlorophylle*), six of starch, twenty-seven of woody substance, and six of saline matters.*

According to the experiments of Dr. Clutterbuck, elaterium is almost entirely, if not wholly, confined to the limpid fluid contained in the centre of the cucumber, for no other part of the plant has been found to possess active properties. It is evident, therefore, that the common mode of preparing this substance, namely, by pressing the fruit, and collecting its ordinary juice, together with that which is lodged in the centre, and afterwards evaporating it, must yield an article of inferior and uncertain powers. Dr. Clutterbuck recommends the following method for preparing this medicine, and its superiority over the modes usually adopted is manifest.

"The cucumbers should be gathered when as nearly ripe as possible, and without violence, that might endanger their *bursting*. They should then be wetted by the affusion of cold water, that less of the juice, when they are cut, may adhere to the external surface. In this state they should be cut through longitudinally, and the juice allowed to strain through a fine sieve placed in a large earthen vessel. The seeds and surrounding pulp should be scooped out upon the sieve, and washed with repeated affusions of cold water, by which they will be freed from all adhering juice. Something will be saved also by afterwards rinsing the split cucumbers themselves in cold water, from which a portion of elaterium may be collected. After standing a few hours, a sediment is formed, from which the clear liquor is to be poured off; it is then to be thinly spread on fine linen, and exposed to the air to dry; a gentle warmth may be employed without injury; but the access of sunshine destroys the fine green color which the substance otherwise acquires."†

Elaterium is a very ancient remedy, and was, for a long time, much esteemed as a hydragogue in hydropic diseases. In modern times it had, however, almost sunk into entire neglect, in consequence of its occasional harsh and violent operation, until it was again brought into notice as a remedy for dropsy, by Dr. Ferriar. It certainly is a medicine of exceedingly active powers, and may readily do mischief if improperly administered. Elaterium, says

* Hennel's analysis is published in the Journal of the Royal Institution of Great Britain, for May, 1831.

† London Medical and Physical Journal, July, 1819.

Dr. Clutterbuck, is, with the exception of arsenic, perhaps, and the hydrocyanic acid, the most active article of the materia medica; and Dr. Ferriar observes, that "on its first exhibition to a patient, it is nearly as active and as dangerous, if incautiously given, as arsenic." It is, nevertheless, susceptible of such management in its administration, as to render it, not only a safe, but a most valuable remedy.

"Its powers," says this latter writer, "in removing serous accumulations in the cavities of the human body, surpass those of any other medicine; and the astonishing relief which it affords in the dyspnœa occasioned by hydrothorax or ascites, even in persons of the most advanced age, must place it in the first class of hydragogues." Dr. Clutterbuck also speaks in the highest terms of this remedy. "I know of no medicine," says he, "from which I have derived greater benefit, on various occasions, nor one in which greater confidence may be placed. Whatever can be accomplished in the cure of diseases, by active purging, may be effected certainly by this medicine."

The sensible effects of this substance, when given in a full dose, are, excessive nausea, copious and frequent watery stools; and if the dose be very large, vomiting, violent pains in the stomach and bowels, inflammation of these organs, spasms, and death. Along with its cathartic effects, it excites the action of the heart and arteries, even when given in moderate doses.

When prepared according to the method of Clutterbuck, one-eighth of a grain will be sufficient to produce violent purging. As it is usually met with in the shops, its dose is from one to two grains. It should, however, always be commenced with in a small dose, as, for instance, half a grain, and repeated every hour until the desired effects be produced. Dr. Ferriar states, that he generally gave it in union with some diuretic, when employed in dropsy, and commencing with a very small dose, sometimes carried to the extent of six grains a day.

The crystaline principle of Hennel, or *elaterin*, according to the experience of Dr. Duncan of Edinburgh, produces active purging when exhibited in the dose of one-twelfth or one sixteenth of a grain. "The quantity of elaterin varies exceedingly, in different parcels of the drug. Mr. Morris obtained twenty-six per cent. from the best British elaterium; fifteen per cent. from the worst, and only five or six per cent. from the French; while a portion procured according to the London College, yielded to Mr. Hennel upwards of forty per cent. This great diversity in the strength of elaterium renders the substitution of its purgative principle, or *elaterin*, highly desirable."*

* United States Dispensatory.

Formulæ.

℞.—Ext. elaterii gr. iii;
Spir. nit. dulc. ℥ii;
Tinct. scillæ,
Tinct. colchici, āā ℥ss;
Syrup. rhamn. cathar. ℥ss.—M. Chisholm has found this mixture highly serviceable in ascites. He gave a teaspoonful every six hours. (Lond. Med. Repos., March 1824.)

Or, according to Dr. Ferriar,

℞.—Extract. elater. gr. i;
Spir. nit. dulc. ℥ii;
Tinct. scillæ,
Oxymel colchic., āā ℥ss;
Syrup. rhamni ℥i.—M. Take one drachm three or four times daily.

℞.—Ext. elaterii, gr. ii;
Pulv. sacch. alb. ʒi.—M. Divide into eight equal parts. Take one every fifteen minutes until purging is produced. (Brand. Mat. Med., p. 483.)

CROTON TIGLIUM.—CROTON OIL.

The oil which is obtained from the seeds of this plant, has been recently introduced to the notice of the profession, as one of the most active purgatives known. It is generally supposed to be a *new* remedy, but this is a mistake; both the seeds and oil were very early noticed and employed in medicine. Serapion the younger mentions this plant and its seeds. (De Simplicibus, c. 261.) M. Pomet, chief druggist to Louis XIV., in his General History of Drugs, speaking of the seeds of Tiglium, says, "the use of these kernels is to purge, and it is indeed one of the greatest purgatives we have."* M. Lemary speaks of the oil of these seeds "as being capable of exciting purging, simply by rubbing the stomach and belly with it."† Rumphius, also, speaking of this plant, says, "Olim grana (tiglii) per totam Indiam Orientalem crebro in usu fuerat, ad lympham hydropicum per alvum, præprimis, eliminandam, in iis vero, quorum ventriculus debilis simul emesis subsequenta. Fortioribus bina grana sufficerunt, aliis granum unum cum semisse. Variis aliis in morbis in quibus purgantia fortiora opportuna videntur, ista in India adhibent. Et hanc quidem acrimoniam olei ipsi semini inesse, tam ex dictis quam inde apparet, quod olei ex siccis granis expressi *gutta una*

* Medical Histories, vol. i. p. 46.

† Vide Mr. Iliff's Paper, in the 97th number of the London Med. Repos.

cum canariensi vino capta vulgare apud chirurgos in India degentes purgans constituerit."* The seeds are also mentioned by Dr. Fleming in the 11th volume of the Asiatic Researches, as having been formerly well known and employed in Europe as hydragogue purgatives. Bergius, Lour, Linnæus, and Burdach speak of the *grana* tiglii as powerfully purgative.

According to the experiments of Dr. Nimmo, alcohol of sp. gr. 825, dissolves only a portion of the oil. The part which remains undissolved, is destitute of the characteristic acrimony of the oil, "this property being entirely transferred to the alcoholic solution, which answers the medicinal properties of the entire oil in a more certain manner, and unattended by several inconveniences formerly experienced from its use." The oil contains forty-five parts of acrid principle, and fifty-five of *fixed* oil. The acrid principle is united with a resinous substance which is dissolved by alcohol, sulphuric ether, volatile and fixed oils.† The oil itself is converted into a saponaceous mass by means of an alkali.

This oil is powerfully purgative. Given in the dose of from one half to one drop, it produces copious evacuations. Mr. Iliff, apothecary to the South London Dispensary, whose experience with this remedy has been very extensive, thinks, however, that it produces nausea and griping more frequently than has been supposed; nor does it appear to be uniformly certain in its operation. Mr. Iliff states, that he gave nine drops in a case of apoplexy, in three drop doses, without any operation whatever; whereas, ten grains of calomel, which was afterwards resorted to, acted briskly.‡ This accords with my own experience; and it is now pretty generally admitted to be uncertain in its operation, causing copious discharges in some instances, whilst in others it operates very imperfectly, giving rise to small mucous stools, and extremely severe tormina. I have myself taken it twice; in both instances it operated but sparingly, and left a considerable feeling of soreness throughout the abdomen. There are, nevertheless, some writers who speak favorably of its powers as a purgative. We have the testimony of Dr. Carter, one of the physicians of the Kent and Canterbury Hospital, in favor of the employment of this article as an active purgative. He says that he employed it in seventeen cases, in one of which only did it fail to operate. Croton oil has been successfully used in maniacal cases. Sir George Tuthill, one of the physicians to Bethlehem Hospital, has found it beneficial in affections of this kind. It has also been used

* Vide Medico-Chirurgical Review for Sept. 1821. Rumphius Herb. Amboininu, tom. iv. p. 98.

† London Medical Repository, vol. xvii.

‡ Ibid.

with advantage by Dr. Pearson;* and it is said to be an excellent hydragogue, and to have proved very serviceable in hydropic cases. Professor Francis of New York states, in a letter to me, that "he is induced to pronounce the oil of croton a powerful and certain and speedy purgative, and free in its action from griping. In a case of most obstinate and very long continued costiveness, he says, it effected what neither the elaterium, nor the other vegetable drastics, nor mercury could accomplish." He thinks it will be found peculiarly serviceable in habitual torpor of the intestinal canal.

This oil appears to make a very powerful and prompt impression on the nerves. The editor of the London Medico-Chirurgical Review† says, that "cases of tic douloureux have been lately relieved, and even removed, by a drop or two of oil of croton applied to the tongue. The effect on the nerve was almost instantaneous. Mr. Frost says, that he has seen instances in which the application of this oil to the tips of the fingers "produced a sense of numbness in the fingers, hand and arm, (but no local inflammation,) dryness in the throat; and headache, which continued for several hours." It generally, however, produces a very considerable degree of local inflammation when applied externally.

It may be conveniently given in the form of pills, made with the oil and crumbs of bread.

The violence of the action of this oil may be lessened by giving it in union with some aromatic, and particularly with any of the volatile oils: viz. oleum caryophyllum, cinnamomi, &c. Roasting or baking the seeds, previous to extracting the oil, is said also to lessen the violence of its action. The vegetable acids are likewise said to moderate its action.‡ Dr. Frost recommends the following formulæ for exhibiting this oil.

Formulæ.

℞.—Ol. expres. sem. croton. gtt. i;
Ol. caryophyll. gtt. i;
Confec. rosar. gr. iv.—M. Form into a pill.

℞.—Extract. jalapæ aquos. ʒss;
Ol. croton. gtt. 3.—M. Divide into ten pills. Take two every hour until they operate.

℞.—Olei croton tiglii gtt. ii;
Saponis albi gr. ii;
G. Arab. q. s.—M. Divide into four pills. Take two pills. (*Tavernier.*)

* A Sketch of the Botanical Literature, &c., of Croton Tiglium. By John Frost, Esq. See London Med. Repos., July 1822.

† No. vi. p. 428. New series.

‡ Lond. Med. Repos., June 1822.

OLEUM RICINI.—CASTOR OIL.

This oil is obtained by expression, or decoction, from the seeds of the *Ricinus communis*, a plant which grows wild in the East and West Indies, and some parts of South America, and which is now cultivated in this country.

It is a yellowish or colorless oil, possessing a faint, peculiar sweetish taste, and scarcely any odor. On being swallowed it excites an unpleasant acrid burning in the throat and fauces, which, however, is but very slight when the oil is fresh and entirely free from rancidity. It is wholly soluble in alcohol, and sulphuric ether; and mixes more readily with caustic ley than any other oil. These circumstances distinguish it from the other fat oils, and enable us without difficulty to detect its adulterations.

Castor oil is very mild, unirritating, but certain and prompt cathartic, procuring copious fecal evacuations, without appearing to excite the intestinal emunctories, since it hardly ever occasions any very liquid or watery discharges. When we wish simply to evacuate the contents of the bowels, or avoid costiveness, there is no article belonging to this class of remedies so well adapted as castor oil to answer our intentions. Independent of the mildness and completeness of its operation, it is less apt than any other cathartic to leave the bowels in a dry or costive condition.

In cases of obstinate constipation, castor oil, though often insufficient, by itself, to produce adequate evacuations, acts in general with much advantage when given some hours after the exhibition of a full dose of calomel, or calomel and jalap.

No laxative is more commonly employed in the treatment of dysentery than this one; and when the stomach can bear it, it is, without doubt, a very important remedy. "Oleum ricini," says Dr. Bampfield, "is, perhaps, better calculated to afford relief in dysentery than any other aperient or cathartic; for its action is not only mild and generally effectual, but I have observed that some of it passes undecomposed, in its oily form, through the intestines, and appears on the surface of the excrement, and hence may serve as a sort of sheather or defence to the diseased intestines, from the stimulus of feces and morbid secretions."

A common mode of prescribing it in this disease, when there are much tenesmus and griping, is in union with a full dose of laudanum. Given in this way, it is much less apt to be rejected by the stomach, and it moreover mitigates directly the sufferings of the patient, and loses but very little of its aperient effects.

Castor oil has also been much recommended in the treatment of colica pictonum. It is particularly useful in this disease to put

the bowels in motion, after large doses of calomel and opium have been administered.

In the form of an emulsion it is a very excellent aperient for children.

Castor oil has also been highly recommended as a remedy for the expulsion of the tape-worm. Dr. Odier of Geneva, and Dunant, employed it with much success in expelling the *unarmed tænia*,* and Brera states that "it sometimes serves wonderfully well to expel also the armed tænia."† After having previously administered three drachms of powdered *male fern*, Odier gave the ol. ricini by tablespoonfuls, every half hour until full purging was induced. Brera, however, recommends it to be given to the extent of three ounces for a dose. "In my journal," says he, "I have two cases of armed tæniæ expelled by three ounces of this oil, taken by a patient during three successive days, and by another taken twice a day for a week."

The celebrated S. G. Vogel has introduced a composition which strongly resembles castor oil, and which forms an excellent substitute for it when it is rancid. It consists of nine grains of resin of jalap, three grains of Venetian soap, to be triturated in a mortar, with an ounce and a half of oil of olives. The dose is a tablespoonful. Dr. Schmitman speaks very highly of this mixture in dysentery. He says it always allays the pain and severe excitement of the intestines, but at the same time gently and completely evacuates their contents.‡ An ounce of castor oil is a full dose for an adult. It may, in general, be more conveniently taken in hot milk than in any other way.

Formulæ.

The following is an excellent mode of exhibiting castor oil where there are much griping and tenesmus in dysentery.

℞.—Ol. ricini ℥i;
Vitel. ovi q. s. tere simul et adde
Syrupi papaveris ʒii;
Tinct. opii gtt. xviii;
Aq. fontanæ ℥iss.—M. ft. haustus. To be taken at once.

For children, the following emulsion will be found convenient:

℞.—Ol. ricini ℥i;
Sacch. alb. ʒi;
Album ovi q. s. tere simul et adde, gradatim,
Aq. menthæ ℥ss;
Aq. fontanæ ℥ii.—Dose for a child one year old, a teaspoonful every hour.

* Manual de Médecine-Pratique, par L. Odier, p. 225.

† Treatise on Verminous Diseases, by V. L. Brera, Professor of Clinical Medicine at Pavia, p. 234.

‡ Summa Observationum Medicarum, &c.

℞.—Magnesiæ alb. ʒss;
Ol. ricini ʒi;
Syrup. limonis ʒss.—M. First triturate the oil and magnesia together, then add the syrup. This forms an elegant and highly useful purgative for young children.

℞.—Ol. ricini ʒii;
Syrup. rhæi ʒiv.—M. Dose, a teaspoonful for an infant.

SULPHUR SUBLIMATUM.

The sulphur of commerce is extracted from pyrites by sublimation. In volcanic districts, it is occasionally found in a perfectly pure and crystallized state; and it exists in a combined state in some animal and vegetable substances. It is insoluble in water and alcohol, but perfectly soluble in both the essential and fixed oils. Linseed oil is one of its most powerful solvents.

Sulpher was much esteemed for its medicinal powers by the ancients, and continues to this day to hold a very important rank among the articles of the materia medica. When taken in a dose of from one to two drachms it acts as a mild and pretty certain laxative, producing one or two copious evacuations, without either heating the system or griping the bowels. "These circumstances," says Dr. Cullen, "render it a most proper and convenient laxative; and were it not for the fetor that sometimes attends its operation, and is ready to be diffused in the air around, sulphur would be one of the most agreeable laxatives that could be employed."

Sulphur, when taken into the alimentary canal, appears to pass with facility into the circulation, as is evinced by the sulphurous odor which the breath and cutaneous exhalation of those who take sulphur soon acquire; and also by the black color which polished metals, carried in the pockets of such persons, are apt to contract.

As a purgative, sulphur seems to direct its action more especially upon the lower portion of the bowels, and to excite the activity of the circulation in the portal system of vessels. It has been accordingly much recommended in hemorrhoidal affections, more, however, with a view of obviating than of removing the disease. With the view of keeping up a regular action of the bowels, so as to procure one or two soft stools daily, without actual purging, this article, in combination with cream of tartar, or with magnesia, will, in general, answer an excellent purpose, in slight cases of this affection. In bleeding piles, however, and where much inflammation or ulcerated fissures exist, sulphur is by no means a proper remedy, and ought to be wholly abstained

from. Its usefulness is, in a great degree, confined to the hemorrhoidal habit, with a tendency to constipation, with the view of preventing congestion in the portal vessels, and the consequent formation of varicose hemorrhoidal tumors.

The most important medicinal powers of this substance are, however, those which it possesses against various obstinate diseases of the skin. Alibert considers it as the most efficacious article we possess in affections of this kind. "I have used sulphur a great deal in my practice," says he, "and have removed cutaneous eruptions with it, that had resisted all the other means known." It is observed by the same author, that persons whose employment exposes them much to the fumes of sulphur, are never affected with chronic cutaneous eruptions. He considers it as particularly efficacious in the cure of herpetic diseases. For the cure of tinea capitis, too, he thinks that there is no remedy superior to the unguentum sulphuris. I have, however, employed the kali sulphuretum, according to the prescription of Barlow,* with much better effect than the simple sulphur ointment.

For the cure of psora it is a very common remedy. I have found Jasser's ointment, as it is altered in the Prussian Pharmacopœia, a very useful remedy in this disagreeable affection.†

For the cure of psora in children, Dr. Clark, of Dublin, recommends a lotion, made by pouring a quart of boiling water on an ounce of broken sulphur, and suffering it to infuse for twelve hours. In this process, says Dr. Paris, the water probably takes up a small portion of sulphurous acid.

Munro speaks very favorably of a union of sulphur and crude antimony in chronic rheumatism; and Schaeffer (Hufeland's Journal), strongly recommends a combination of magnesia, sulphur and nitre, in rheumatic affections of the internal organs, particularly of the stomach. Hufeland asserts that he had succeeded in keeping off the attacks of gout for years, by the use of sulphur and gum guaiacum, given in combination, and in doses sufficient to procure two or three alvine evacuations daily repeated three or four days in succession, once every month. (Journal, B. 14, St. 1, p. 181.)

Sulphur has alone been much praised as a remedy in gout and

* ℞.—Kali sulph. (recen. preparat.) ʒiii;
Sapo hispan. ʒi;
Aq. calcis ℥viii;
Spir. vin. rect. ʒii.—M. fiat lotio. Wash the head morning and evening.

† ℞.—Flor. sulphuris ℥ii;
Sulp. zinci ℥ii;
Ol. lauri. auxung. procin. q. s.—M. ut fiant unguent.

rheumatism. Barthez, in particular, commends its powers in the former of these diseases; in the chronic form of the latter, I have, in several instances, derived great advantage from the employment of sulphur, in combination with guaiacum. Its beneficial operation in these diseases is, no doubt, mainly dependent on its tendency to excite the cutaneous exhalents, and to equalize the general circulation.

Wedekind, a German physician of celebrity, speaks very favorably of the employment of sulphur, in the dose of twenty grains, with double the portion of gum Arabic, in the cure of dysentery. "The bloody discharges," he says, "together with the tormina and tenesmus, often cease as soon as a few doses of this medicine have been administered."* Sulphur has also been recommended in amenorrhœa. Richter observes, that it is especially useful in cases where the menses are suddenly arrested during their flow, by cold or violent mental emotions; and in deficient menstruation, with torpor of the bowels, much benefit may sometimes be derived from its use, provided the general habit be not phlogistic.†

Werlhof recommends the internal employment of sulphur as a valuable remedy for the anasarca, which is sometimes the consequence of scarlet fever.

In certain chronic pectoral affections, also, much advantage may sometimes be obtained from the employment of sulphur. In chronic catarrh, attended with a copious expectoration of a muco-purulent matter, I have derived great benefit from the mixture recommended by Englehard,‡ according to the first formula mentioned below. The preparations so highly recommended by Dr. Hoffmann, may also be used with peculiar advantage in chronic bronchitis. Formerly, I was much in the habit of employing this combination, and occasionally with the most decided benefit. See formula No. 2. Kopp speaks greatly in favor of a union of sulphur and the extract of belladonna in hooping-cough; and Randhahn (Rust's Mag. Bd. 24, p. 493), prescribed in this affection a combination of sulphur and ipecacuanha, in the proportion of four grains of the former to two grains of the latter, two or three times daily, with much benefit. Herholdt, Garnett, and Hoffmann, recommend the use of sulphur and pulverized charcoal in chronic pulmonary catarrh.

Sulphur has also been especially recommended in various blennorrhagic, or chronic mucous discharges. Hermann asserts that he has known the internal use of sulphur to produce the happiest

* Burdach's Arzneimittellehre, Bd. 111, p. 14.

† Richter's Ausführliche Arzneimittellehre, Bd. 3, p. 423.

‡ Die lungens, in ihr. vershid. formen und Zeiträumen, p. 97.—1823.

effects in morbid mucous discharges from the bladder and vagina.* Pitschaft, an eminent German writer of the present day, states, that in catarrh of the bladder, he has derived important advantages from the employment of a drachm of the flowers of sulphur with two grains of calomel, twice daily. (Hufeland's Journal, Bd. 49.)

* Sulphur is, by many, supposed to have the property of diminishing the salivant effects of mercury, and it is accordingly a good deal prescribed for the purpose of moderating ptyalism. I do not believe, from what I have observed in my own practice, that it possesses any virtues in this respect beyond what may be ascribed to its diaphoretic operation.

Formulæ.

No. 1. ℞.—Extract. hyoscyam.,
Flor. sulph.,
Extract. glycyrrh., āā ʒi.—M. Eight grains of this mixture are to be taken three times daily.—*Englehard.*

No. 2. ℞.—Ol. amygdalar. dul. ʒii;
Flor. sulph. ʒii. Boil them gently, until the sulphur and oil are completely united; then add, still keeping it at a boiling heat,

Bals. copaib.	ʒi;
Ol. anisi	gtt. xx;
Spermaceti	℈iv;
Syrup. papaveris	ʒss.—M. Dose, a drachm three or four times daily.—*F. Hoffmann.*

Pulvis liquiritiæ compos. Pharm. Boruss.

℞.—Pulv. rad. glycyrrhiz.	ʒi;
Pulv. fol. sennæ,	
Pulv. sem. anisi,	
Flor. sulph.,	āā ʒi;
P. sacch. albi	ʒiv.—M. This mixture is said to be an excellent medicine in catarrhal affections. If febrile irritation attends, half an ounce of powdered nitre should be added. The dose is a teaspoonful three or four times daily.

℞.—Phos. sodæ,	
Magnes. carbon,	
Flor. sulph.,	
P. sem. fœnicul.,	āā ʒii
P. camphoræ	gr. xvi.—M. Divide into sixteen equal parts. One to be taken every three or four hours until the bowels are moderately moved, in hemorrhoidal affections.—*Richter.*

Other formulæ, for the internal use of this article, are given in treating of sulphur as a diaphoretic.

* System d. praktischen Heilmittill, Bd. 2. p. 89.

MAGNESIA.

NATURE nowhere presents us with this substance in a pure state. It is commonly found in combination with sulphuric acid, from which it is separated by precipitating it from its solution by potash.

Magnesia is a white and very light earthy substance, having a specific gravity of 2·3. It converts very delicate blue vegetable colors to green; is very sparingly soluble, requiring two thousand times its weight of water to hold it in solution. The solutions of alkaline carbonates dissolve it; but those of the caustic alkalies have no action on it. It increases the solubility of camphor, opium, and resins in water.* It combines with sulphur.

This substance was, for a long time, sold in Italy as a secret remedy, under the name of magnesia alba, or Count Palma's powder; and it was not until about the middle of the last century that it was introduced into practice as a regular remedy. At present it is much employed as a mild aperient, both in its pure state and in that of a carbonate.

As a laxative, magnesia is by no means uniform or certain in its operation. Its purgative effect depends, in a very considerable degree, on the presence or absence of acid in the primæ viæ. When the stomach is free from acidity, it seldom produces free evacuations, unless given in very large doses; whilst even moderate doses often operate promptly and pretty actively when it meets with acid in the stomach. This circumstance renders it peculiarly serviceable where an acid exists in the primæ viæ. It unites with the acid, and, acquiring thus the character of a neutral salt, acts with greater energy as a purgative. If the carbonate of magnesia be employed under such circumstances, the acid in the stomach, uniting with the magnesia, evolves a considerable portion of carbonic acid gas, and may thus create painful flatulent distensions. This effect is obviated by using the pure magnesia, instead of the carbonate. Magnesia is particularly valuable as a laxative for infants, affected with acidity of the primæ viæ, flatulency and colic. The usual mode of prescribing it in the gastric complaints of infants, is to unite it with a few grains of rhubarb. I have generally given it in combination with rhubarb and powdered valerian, in the proportion of three grains of the two first with two grains of the valerian. In weak and nervous subjects, the magnesia may be very beneficially given in union with rhubarb and powdered orange peel. This combination is particularly

* Paris's Pharmacologia.

useful in relaxed and hysterical females. A mixture of an ounce of magnesia with a drachm of rhubarb, and the same quantity of orange peel, is recommended by Richter in such cases—in teaspoonful doses until the bowels are freely moved.

When in the advanced stage of low fevers, or during convalescence, symptoms of acidity in the stomach manifest themselves, the union of gentian, ammonia and magnesia is, according to Mr. Brande, an excellent remedy. Half a drachm of the magnesia, with the same quantity of aqua ammonia, and ten drachms of the infusion of gentian, may be given at one dose. (Mat. Med. p. 157.)

Magnesia has been much commended for its good effects in gout. Dr. Scudamore,* however, states his conviction, that its use in this disease is derived solely from its qualities as an antacid and purgative; and that in no other way than by such influence on the stomach and alimentary canal, can he consider it as having any claim to our regard.

In cases of dyspepsia, attended with an acid in the stomach, magnesia may be advantageously united with aromatics and some of the milder tonics. In this way we not only remove the morbid contents of the stomach, but at the same time also invigorate this organ, and thereby counteract the new formation of the acid.

Used simply as an absorbent or neutralizer, magnesia is highly useful in all affections attended with morbid acidity of the stomach. In the griping bowel-complaints of children, attended with green or sour stools, magnesia is much employed, in which it is, indeed, a very useful remedy. For this purpose, the prescription given below is a very convenient form of exhibiting it.†

In dyspepsia, attended with acidity in the primæ viæ, pain and flatulency, Dr. Johnson highly recommends a mixture composed of half a drachm of the carbonate of magnesia, a drachm of the aromatic spirit of ammonia, half an ounce of the tincture of rhubarb, and half a drachm of the tincture of hyoscyamus, with four ounces of water, in tablespoonful doses, two or three times daily.‡ I have myself employed this mixture with very excellent effects in cases of this kind. Richter speaks very favorably of

* Treatise on the Nature and Cure of Gout, &c., p. 278.

† R.—Magnes. calc. ℥ss;
Pulv. rhei gr. viii;
Sacch. alb. ℥i;
Pulv. g. Arab. ℥ss;
Aq. menth. ℥ss;
Aq. fontanæ ℥i.—Misce. Dose, a teaspoonful.

‡ Essay on the Morbid Sensibility of the Stomach.

the employment of magnesia, in union with lac sulphuris, in doses of twenty grains of each, twice daily, in acidity of the stomach attended with flatulent pains in the abdomen. (Spec. Therap. B. 4, p. 92.)

Magnesia has, of late, been recommended as a very useful remedy to prevent the too copious secretion of uric acid by the kidneys, and consequently, to obviate the formation of those urinary calculi which are chiefly or wholly composed of this acid.*

Mr. Brande has published some very interesting experiments and observations on the comparative value of magnesia and alkalies in calculous affections. Sir E. Home has suggested the superiority of the former over the latter, on the ground of its possessing less solubility, and being, therefore, more apt to remain longest on the stomach, and to counteract the formation of uric acid. The correctness of this suggestion, so far as regards the fact, was confirmed by the experiments of Mr. Brande. Dr. Scudamore admits the fact of its superiority over the alkalies; but he ascribes it chiefly to its purgative qualities, by which the acid of the stomach is not only neutralized, but also carried out of the body. Dr. Marcet,† on the contrary, contends that the alkalies are superior to this article as a means for correcting the lithic acid diathesis; but the inference to be drawn from these contradictory statements is, that there is no certain appreciable difference between magnesia and the alkalies in this respect, except what may arise from the purgative powers of the former, or accidental circumstances.

Magnesia has, of late years, been strongly recommended as a remedy in diabetes. Trotter asserts that he succeeded in curing two cases of diabetes mellitus by the use of half a drachm of carbonate of magnesia four or five times daily. Haase also speaks very favorably of this article in diabetes. (Chron. Krank. v. 3.)

Magnesia may be conveniently given in union with other purgatives. It is frequently united with lac sulphuris; in which combination it is said to be particularly useful in bilious complaints. The dose of the carbonate, for an adult, is from twenty to sixty grains. Infants may take from two to five grains.

It ought to be observed, that from a considerable number of authentic cases reported in the journals within the last ten or twelve years, it would appear that the long use of magnesia produces sometimes enormous and dangerous accumulations of this substance in the large intestines.

* Brande on Calculous Disorders, in the Philos. Trans., 1810, p. 1.

† An Essay on the Chem. Hist. and Med. Treat. of Calculous Affections.

In the Journal of Science and the Arts, No. xi. Mr. Brande has given an account of two cases, "in which the long-continued use of magnesia was productive of a concretion of this earth in the bowels, in an immense quantity," and which "gave rise to many of the worst symptoms attendant on an obstruction of the intestinal canal." In the second case, it is stated that "not only large quantities of a concretion of a similar description were voided, but upon examination after death, which took place perhaps six months after any magnesia had been taken, a collection, supposed to be from four to six pounds, was found imbedded in the head of the colon, which was, of course, much distended." Cases similar to these have since been published by other physicians.

Carbonate of magnesia has been much recommended by some late writers as an antidote. Mr. Marshall* mentions this article as one of the most valuable remedies in cases of poisoning from arsenic. Mr. Hume, also,† speaks highly of its effects in this way. He relates a case of poisoning by arsenic, of a very hopeless character, which was cured by the composition given below.‡ Orfila, from some experiments made with this article as an antidote, concludes, that magnesia is decidedly the best medicine in poisoning from sulphuric or nitric acid.

Formulæ.

℞.—P. rad. valerian ʒi;
P. rad. ireos florent. ʒiss;
P. rad. liquir. ʒii;
P. sem. anisi. ʒss;
Magnes. carbon. ʒi.—M. ft. pulv. From six to eight grains of this may be given to an infant twice or thrice daily.—*Hufeland.*

℞.—Magnes. alb. gr. xii;
Sacch. alb. ʒii;
Aquæ fontanæ ℥i;
Tinct. opii gtt. iii.—M. Dose, a teaspoonful for an infant every two hours, until relief is obtained.—*Dewees.*

* Remarks on Arsenic.

† London Medical and Physical Journal, Nov. 1821, p. 466.

‡ ℞.—Magnes. carbonatis ℥i;
Aquæ distillæ ℥xv;
Vini opii ʒiss;
Spiritus lavand. comp. ʒiii;
Sacchari albi ℥ss.—M. Capiat æger cochlearia duo magna frequenter, phialâ assidue agitatâ

NEUTRAL SALTS.

SULPHAS SODÆ.—GLAUBER'S SALTS.

This salt is one of the most common and useful purgatives we possess. In general the saline cathartics are preferable to any of the other purgatives in diseases of a decidedly phlogistic character, on account of their tendency to moderate febrile irritation by their general antiphlogistic influence, as well as their aptitude to increase the renal secretion. The operation of this, as well as of the succeeding article, appears to be principally directed upon the small intestines, giving rise to free liquid evacuations; and hence it seldom answers well for the removal of the loaded or infarcted state of the lower portion of the bowels, so common in chronic affections. In plethoric, robust, and irritable habits, and in acute inflammatory or congestive affections, particularly of the head, such as a tendency to apoplexy, ophthalmia, encephalitis, and in the exanthematous and other general febrile diseases, the sulphates of soda and magnesia are peculiarly valuable purgatives. They cannot, however, in general, be so properly used in chronic affections attended with general languor and weakness, unless some local inflammation or high irritation exists, as is often the case in leucorrhœa. This salt consists of 24·64 parts of sulphuric acid, 19·36 of soda, and 56 of water. It crystalizes in transparent six-sided prisms, terminated by dihedral summits. When exposed to the air it effloresces. It possesses a saline and disagreeable bitter taste. One ounce of water at 60° dissolves ʒiiiss of the salt; boiling water dissolves it in much greater proportion; in alcohol it is quite insoluble. It is decomposed by the *muriates of ammonia, baryta,* and *lime; nitrate of silver; subacetate* and *acetate of lead.*

The dose is from ʒss to ʒii; when administered in lemonade, or with the addition of a small portion of cream of tartar, it is much less disagreeable to the taste.

It does not appear to be generally known that Glauber's salt is much more active in the *dry and effloresced,* than in the crystalized state. Half an ounce of the former will, in general, operate as promptly and actively as an ounce of the latter. Richter, however, says that the effloresced is not so *certain* in its purgative effects as the crystalized salt; but I have not noticed any difference between them in this respect. Glauber's salt may be very advantageously given, in small doses, united with tartar emetic, as an antiphlogistic aperient in febrile complaints. An ounce of the salt with half a grain of tartar emetic dissolved in a pint of

water, may be used in tablespoonful doses every hour until the bowels are pretty freely moved. The French call this combination *sel de Guindre.* When the febrile excitement runs high, a portion of nitre may be very appropriately added.

SULPHAS MAGNESIÆ —EPSOM SALTS.

This is also a very common and useful purgative. It consists of small, needle-like, tetrahedral prisms; possesses a bitter taste, and is soluble in its own weight of water at 60°. When pure, it effloresces on being exposed to the open air. It is decomposed by "baryta, strontia, the alkalies, and all the salts formed by these salifiable bases, excepting the alkaline muriates; and by the nitrate, muriate, and carbonate of lime." The addition of a little common salt is said to increase its purgative powers, and a small portion of tart. antimony quickens its operation. The dose is from ʒss to ʒii. The sulphates of magnesia and soda differ but little in their effects. Being less apt to heat the system than the other active articles of this class, they are more particularly applicable to the treatment of febrile diseases. Given with a minute portion of antimony, according to the directions of Sir Gilbert Blane and Dr. Chisholm, they are exceedingly useful in the beginning of bilious fever. A solution of ʒii of either of these salts, with gr. ii of tart. antimony, in a pint of water, may be very usefully given in the beginning of such fevers, in doses of a wineglassful every hour, until vomiting and full purging are produced

The sulphate of magnesia is, in general, less apt to be rejected by the stomach than the sulphate of soda, and it is, on this account, best suited to cases attended with morbid irritability of the stomach. It has been said that Epsom salt has a particular power of moderating gastric pain, independent of its cathartic effects. Exhibited in small and frequently repeated doses, its effects have been particularly extolled in ileus and colica pictonum. According to Orfila, the sulphates of magnesia and soda are peculiarly useful as purgatives in poisoning by sugar of lead, and Buchner, in his valuable work on Toxicology, makes the same statement, from facts which had come under his own observation. A solution of this salt in lemonade is a very convenient and efficacious laxative in the diseases of very young children.

The sulphate of magnesia is particularly recommended by Mr. Brande, for the purpose of obviating habitual costiveness. It must be given in small doses, and in union with some bitter tonic infusion. Thus, half a drachm of the salt, dissolved in six drachms of the infusion of gentian, with one drachm of ginger syrup, and

ten drops of elixir of vitriol, taken an hour before eating at noon, will seldom fail to procure an alvine evacuation towards evening.

SULPHAS POTASSÆ.—VITRIOLATED TARTAR.

This salt crystalizes in small, transparent, hard, six-sided prisms, terminated by six-sided pyramids. It is bitter, and dissolves slowly in water, requiring ℥i of water at 60° to dissolve twenty-four grains of the salt; in alcohol it is quite insoluble. It consists of 32.8 acid, 67.2 of potass and water. The barytic salts, the nitrates and muriates of strontia, and lime decompose this salt; it is *partially* decomposed by the tartrates and the salts of mercury, silver and lead.

Sulphate of potass acts as a gentle aperient, when given in doses of about twenty or thirty grains. In the dose of from ʒv to ʒvi, it acts as a mild cathartic, though, on account of its difficult solution, it acts much slower than the two preceding salts. It appears to be more apt, when given in aperient doses, to debilitate the digestive organs than any other of the saline purgatives. It does not excite the intestinal exhalents so much as the sulphates of soda and magnesia, and in general it procures more consistent stools than the other salts. It is, however, very rarely employed with a view to its purgative effects, except in combination with other articles, when it constitutes a minor ingredient. In union with opium and ipecacuanha it forms the well-known and excellent diaphoretic preparation, *Dover's Powder*. The formula for this preparation is given under the head of *Ipecacuanha*.

SUPER-TARTRAS POTASSÆ.—CREMOR TARTAR.

This is a bi-tartrate, having two proportionals of acid, and one proportional of potass. As it occurs in commerce, this salt is always mixed with a portion of the tartrate of lime, "amounting, on an average, to six, and occasionally even to fourteen per cent. It is but sparingly soluble, requiring for its solution one hundred and twenty parts of water at 60°, and thirty parts at 212°. By long keeping, the watery solution of cremor tartar undergoes decomposition, depositing a mucous matter, and leaving "a solution of carbonate of potass, colored with a little oil."* The solubility of cremor tartar is greatly increased by combining it with boracic acid. The alkalies, alkaline earths, and mineral acids decompose it.

* Paris's Pharmacologia.

Cremor tartar is, for many purposes, an exceedingly useful purgative. It is a mild, cooling, and certain laxative, exciting the intestinal exhalents to a copious effusion of serous fluid, and producing at the same time pretty strong diuretic effects. It possesses, however, a very considerable tendency to weaken the digestive functions; and this circumstance, together with its strong powers of exciting copious serous evacuations, renders it an improper aperient for dyspeptic patients, or such as are of a relaxed and debilitated habit, with a sluggish state of the circulation, and an aptitude to gastric pains, flatulency and acidity. In certain dropsical affections, however, it may be accounted among the most valuable remedies we possess, and there are, in fact, but few hydragogues which have been so generally employed and recommended for the cure of ascites and anasarca, as this article. It is more especially, however, in cases of dropsy, connected with manifest general irritation of the sanguiferous system, that cream of tartar is apt to prove serviceable. In the more relaxed, languid and debilitated cases, it answers best when given in combination with powdered squill and gamboge. Dr. Ferriar gives an account of forty-three cases of dropsy treated by cream of tartar, of which thirty-three were effectually cured. He says: "I think we may fairly rank this medicine in the first class of Hydragogues."* Dr. Home also speaks much in favor of its effects in dropsical diseases.† In my own practice I have often derived the most decided advantage from this remedy in the treatment of ascites.

Among the German writers of eminence, we may cite, in favor of the especial usefulness of this saline hydragogue in hydropic affections, the names of P. Frank, (Epitom., vol. v. p. 189,) Jahn, (Chronish. Krank., t. i. p. 114,) Rhan, Lentin (Beitrag., B. i.), and Richter.

Cream of tartar may be very beneficially united with gamboge and tartar emetic as a hydragogue in dropsical affections. But the most efficient of all the hydragogues I have ever used in dropsy, is a mixture of cremor tartar, tartar emetic, pulv. scillæ, and sulphate of potash, according to the formula No. 1, annexed.

Cream of tartar has been a good deal extolled for its power in removing obstinate constipation. In union with jalap, it will often excite the action of the intestines, after the most powerful cathartics have been given in vain.

In the dose of ʒiv or ʒvi it acts as a hydragogue cathartic; in smaller doses it produces diuretic effects. A very pleasant aperient beverage may be made by dissolving about ʒi of this salt in a pint of hot water, and flavoring it with lemon-peel and sugar.

* Medical Histories and Reflections, p. 46.

† Clinical Observ., Exper., &c., p. 349.

This article may also be employed with peculiar advantage in the early periods of *diseases of the hip joint.* Dr. Physick has been long in the habit of prescribing cream of tartar, in union with powdered jalap, in this affection, and the experience of other practitioners in this country has fully confirmed its usefulness.

Hufeland asserts that he has found no remedy so beneficial in the vertigo of old people as a mixture of cream of tartar and gum guaiacum, in doses of half a drachm of each twice daily. In the vertigo of young persons from vascular congestion of the brain, he employed magnesia and cream of tartar with great advantage. (Jour., B. 3.)

Formulæ.

No. 1. ℞.—Crem. tartar. ℥iss;
Sulphat. potass. ℥ss;
Pulv scillæ ʒii;
Tart. emetic. gr. iii.—M. A teaspoonful to be taken three or four times during the day.

No. 2. ℞.—Crem. tartar. ℥ss;
Sacch. alb. ʒiv;
Cort. limon. recen. ℥ss;
Aq. fervid. ℔iv.—M. This is an excellent cooling aperient beverage.—*Brande.*

CREMOR TARTARI SOLUBILIS.

The union of boracic acid and cream of tartar forms a soluble salt, possessing the sensible and medicinal properties of the latter article. The precise chemical constitution of this combination does not appear to be as yet well determined. According to Berzelius it consists of one part of borate of soda (one part of soda to six parts of boracic acid), and two parts of super-tartrate of potass (one part of potass and six parts of tartaric acid). This salt may be made in various ways. The following mode for preparing it is given in the *Codex Medicamentarius* of Paris. "Let thirty parts of boracic acid and twenty parts of distilled water be heated together in a silver dish; as soon as this has been effected, add in divided portions one hundred and twenty parts of super-tartrate of potass, taking care to shake the mixture continually; the whole will soon liquefy, and by continuing the heat, a pulverulent mass will result."

This combination appears to possess more active diuretic properties than the simple cream of tartar; and it is said to be an excellent aperient in chronic complaints, particularly in jaundice,

chlorosis, hemorrhoidal affections, and in chronic gastric affections with deranged action of the liver, &c. Richter states that this salt is peculiarly beneficial as an aperient in hysterical and hypochondriacal affections; and Bang asserts that it is a better remedy in dropsy than the super-tartrate of potass. (Acta Reg. Societ. Med., Hafn. t. iii.) Selig also mentions it as pre-eminently beneficial in hydropic affections. He gave it according to the formula No. 1. As a laxative, the dose of this salt is one ounce. As a resolvent, it is given in doses of from twenty to thirty grains every two or three hours.

Formulæ.

No. 1. ℞.—Crem. tart. solub. ℥i;
Æther muriatic. ℥ii;
Oxymel scillæ ℥i;
Aq. menth. ℥viii.—M. Dose, two tablespoonfuls every two or three hours.—*Selig.*

No. 2. ℞.—Extract. taraxaci ℥iv;
Ext. chelidonii ℥i;
Crem. tart. solub. ℥vi;
Aq. fœniculi ℥vi.—M.—Dose, a tablespoonful every two or three hours.—*Richter*, Arzneimittel.

TARTRAS POTASSÆ.—SOLUBLE TARTAR.

This salt consists of one atom of acid and one of potass. It is soluble in its own weight of water when in a crystalized state; but when it is in the form of small grains, as it is commonly met with in the shops, it requires four times its weight of water for its solution. Alcohol dissolves it very readily. It is decomposed by magnesia, baryta, lime, and strontia; the sulphates of potass, soda and magnesia, and the muriate of ammonia decompose it partially. It is also entirely or partially decomposed by all acids; "and hence it is improper to join it with tamarinds or other acid fruits, as is too often done in the extemporaneous practice of those physicians who are fond of mixing different cathartics together, and know little of chemistry."*

Soluble tartar, given in the dose of from thirty to sixty grains, acts as a mild and unirritating aperient. In the dose of ℥vi or ℥vii it acts pretty strongly as a cathartic. It is commonly employed in conjunction with senna or the other resinous cathartics, with a view of correcting their griping qualities. Soluble tartar has been much recommended as an aperient in maniacal affections. It has also been recommended in dropsy and jaundice.

* Dr. A. Duncan.

CALOMEL, OR SUBMURIATE OF MERCURY.—MILD CHLORIDE OF MERCURY.

CALOMEL is unquestionably one of the most important articles of the materia medica, whether we consider it in relation to its purgative virtues, or to its more extensive and specific influence upon the animal economy. Under the head of mercury, I shall consider the remedial powers of this article, so far as they depend on its constitutional or specific effects, and confine myself, in this place, merely to a consideration of its virtues as a purgative.

Given in proper doses, either by itself or in combination with other articles of this class, it produces copious evacuations, without any harsh or drastic effects. Along with its cathartic virtue calomel has the peculiar power of exciting the biliary organs, and it is, therefore, particularly adapted as a purgative to all diseases attended with functional derangement of the hepatic system. A combination of calomel and jalap forms one of our most useful and common purgatives in bilious diseases, as well as for the ordinary purposes to which remedies of this kind are usually applied. Where we wish to procure easy, but copious alvine evacuations, we in general find our intentions fully answered by giving three or four grains of calomel in the evening, and exhibiting on the following morning an ordinary dose of any of the milder cathartics.

Calomel, from its possessing very little taste, is well suited as a cathartic for children. In my own practice I seldom employ any other purgative in the diseases of children. It evacuates more freely, and at the same time more mildly, than perhaps any other article of this class, the intestinal mucus which is often morbidly accumulated in the bowels of children. Of late it has been much recommended as a cathartic in dysentery. Dr. James Johnson speaks strongly in favor of large and frequently repeated doses of calomel in this disease, *as it occurs in tropical climates.* He gave *scruple* doses three or four times a day, and he affirms that it was generally followed by great alleviation of all the distressing symptoms which attend this complaint. The biliary organs are almost always prominently disordered in dysentery; and independent, therefore, of its laxative operation, *calomel,* from its tendency to influence the liver, is, doubtless, a remedy of peculiar value in the treatment of this malady. Its usefulness in this respect is, indeed, now almost universally acknowledged; and there are not many physicians, in this country at least, who would neglect the aid which it is capable of affording.

When calomel is given in very minute doses, it has a direct anti-cathartic effect, by lessening the morbid irritability of the intestinal canal. It is, indeed, one of our most valuable remedies for excessive purging. Dr. Ayre, of Hull, in his very valuable work on bilious affections, adduces satisfactory testimony of the utility of small doses of this remedy in cholera, diarrhœa, &c. From an eighth to one-fourth of a grain, given every half hour or hour, very often puts a speedy stop to the most violent vomiting and purging. I have employed it in this way with much advantage in cholera infantum, and especially in chronic diarrhœa, in which latter affection I regard it as decidedly the most important remedy we possess. In affections of this kind it is, perhaps, most effectually administered in union with prepared chalk; or, as I have sometimes given it, with small doses of some astringent vegetable powder, as, for instance, the powdered root of geranium maculatum. It may also be beneficially given, in union with minute portions of *ipecacuanha*, in diseases of this character. Half a grain of calomel, with a grain of ipecacuanha, given every three or four hours, often produces excellent effects in bilious diarrhœa.

Calomel is also frequently employed as a vermifuge; but as I shall have occasion to mention it again in relation to its powers in this way, in the chapter on Anthelmintics, I shall dispense with any further remarks on it in this place.

The usual dose of calomel as a cathartic, is from eight to twenty grains; ten grains may be considered as a medium dose. If given in too large a dose, it is apt to excite vomiting.

SECONDARY PURGATIVES.

HELLEBORUS NIGER.—BLACK HELLEBORE.

This article will be particularly described under the head of Emmenagogues, and I shall, therefore, in this place, speak of it only as a cathartic.

Of all the articles of the materia medica, this has held the greatest reputation among the ancients for its remedial powers, and especially for its virtues as a cathartic. It was particularly esteemed in the treatment of mania, melancholia, and gout. For the cure of this latter disease, it is mentioned by Aretæus as being superior to every other remedy then known.

Black hellebore is an exceedingly active cathartic, and, when given in an over-dose, is apt to produce the most alarming effects. It occasions very copious watery evacuations, and hence it has been a good deal employed in dropsical affections. Dr. Ferriar reports several cases of this kind, in which the good effects of this remedy were conspicuously evinced. He prescribed it in the form of Bacher's tonic pills; a preparation which, on various accounts, deserves much more attention than it appears to receive at the present day. Dr. Ferriar observes that when these pills have succeeded in his practice, their operation was, in general, soon manifested, producing, very early, copious evacuations. Their action, he says, is easy, but in protracted cases, contrary to Mr. Bacher's assertion, they evidently weaken the patient, however cautiously given.* From two to six of these pills may be given three times every day, according to the effects they produce.

The black hellebore is now but seldom if ever employed by itself, or in substance, with a view to its cathartic effects. From twenty to thirty grains of the powdered root are said to be a proper dose for this purpose.

Formulæ.

Bacher's pills. ℞.—Extract. hellebor. nigr.,
Extract. myrrh. aquos., āā ʒi;
Pulv. card. bened. ʒii.—M. In pilulas divid., āā gr. i. pondere. Dose, five pills, three times daily.

℞.—Extract. hellebor. ʒi;
Flor. sulph. ʒii.—M. Divide it into two grain pills.
J. Frank speaks highly of this combination in chronic scabby affections about the head.

CASSIA MARILANDICA.

This species of cassia is exceedingly abundant in many parts of the United States. Its leaves differ but little in appearance and properties from the senna of the shops. The predominant constituents of the leaves of this plant are resin and a volatile substance. "The tincture is of a dark-brown color, and is rendered extremely turbid by water."† I have very frequently employed it instead of the officinal senna; and have always found it a certain and safe purgative. It seems, however, to be more apt to gripe than the common senna, "a quality which may, in a great measure, be corrected, by infusing with the leaves a small

* Medical Histories, vol. i. p. 46.

† Bigelow's American Medical Botany, vol. ii. p. 168.

quantity of the root of glycyrrhiza, or anise, and employing a large quantity of water." The cassia marilandica is not so powerful as the senna of the shops. It requires about one-third more than the latter to produce an ordinary cathartic effect. For a particular description, and very accurate figures of this plant, the reader is referred to Dr. Barton's Vegetable Materia Medica of the United States, vol. i., and to Dr. Bigelow's American Medical Botany, vol. ii.

PODOPHYLLUM PELTATUM.—MAY APPLE.

This is a very common plant in the United States; and everywhere well known on account of its esculent, and, to some, delicious yellow fruit. Its root possesses valuable cathartic properties; but the *turiones*, or young shoots of this plant, are said to be poisonous. Dr. Barton, the present Professor of Botany in the University of Pennsylvania, has shown me a letter from the Rev. F. Heckewelder, of Bethlehem, in which it is stated that the Indians of this country have been known to use these shoots, as a poison, to destroy themselves. According to Dr. Bigelow, the root contains a resin, a bitter extract, fecula, and a small proportion of gum. As a cathartic, the powdered root is pretty extensively employed in some parts of this country. I have myself given it very frequently instead of jalap, and have always found it active and safe in its operation. It is, however, more drastic and apt to gripe than jalap, nor does it appear to be so prompt in its effects as this cathartic. "Its operation," says Dr. Burzon, "in all cases in which I have administered it, is slower than that of jalap, but it leaves the bowels longer in a lax and soluble condition. I once took twenty grains at four o'clock P. M., which gave me no disturbance till next morning, when its operation commenced, and produced continual motions all that day and part of the next night, together with severe tormina; this was the first dose of podophyllum I had ever administered; and its effects being so decided, I have since prescribed it in a multitude of cases, and, for the most part, with similar results. It is more disagreeable to the stomach than common purgatives, and will often occasion emesis."*

Calomel renders its operation milder. In combination with cream of tartar it forms a good cathartic for the cure of anasarca and ascites. It has also been particularly recommended in bilious fevers. It certainly is entitled to considerable attention from the American practitioner, as a useful indigenous cathartic.

* American Medical Recorder, vol. iii. p. 332.

"The medical properties of the podophyllum peltatum," says Dr. Bigelow, "are those of a sure and active cathartic, in which character it deserves a high rank among our indigenous productions. We have hardly any native plant which answers better the common purpose of jalap, aloes, and rhubarb."

The best time for taking up the root is in autumn, when the leaves are turning yellow. The extract of it is said to operate mildly and freely. For excellent figures of this plant, see Bigelow's American Medical Botany, vol. ii., and Barton's Vegetable Materia Medica of the United States, vol. i.

JUGLANS CATHARTICA.—WHITE WALNUT.—BUTTERNUT.

The white walnut grows in considerable abundance throughout the United States, and furnishes us with the most important of our indigenous cathartics. During the American Revolution it was much employed in our military hospitals, and was esteemed as a most excellent substitute for the ordinary officinal cathartics.

The extract made from the inner bark of this tree is alone employed for medicinal purposes. Given in doses of from fifteen to thirty grains, it operates as an active cathartic, without "occasioning heat or irritation." It is thought to be particularly applicable as an aperient in habitual costiveness, as it is less apt than most other cathartics to leave the bowels in a state of languor or costiveness. Calomel increases its activity, and combined with this article, it is said to be especially useful in bilious fevers. The bark of the root will blister the skin. The extract should be made from the bark in the month of May or June.

CORTEX SAMBUCI INTERIOR.

The inner bark of the common elder possesses very active purgative powers. Formerly, it was much used as a hydragogue in dropsy; and Sydenham, Boerhaave, and particularly Dr. Hoffman, speak very highly of its usefulness in this disease. Some sixteen years ago, I employed it in several instances of dropsy, with evident advantage. In conjunction with its cathartic properties, it possesses considerable diuretic powers, and in full doses it is apt to excite pretty active vomiting. From four to six drachms of the dried bark may be infused in eight ounces of water, and taken in tablespoonful doses every half hour until it operates. Its operation is rendered much milder by uniting it with anise or fennel seed. Richter thinks that this article is undeservedly neglected as a remedy in dropsy; and my own observations incline me to the same opinion.

CHAPTER IV.

II. *Medicines calculated to destroy or counteract the influence of Morbific Substances lodged in the Alimentary Canal.*

ANTHELMINTICS.

ANTHELMINTICS are such medicines as have the power of destroying or dislodging and expelling worms from the intestinal canal. The operation of these remedies is not difficult to understand. Some of them act in the manner of poisons on these animals; others destroy them by mechanical action on them; others again simply expel them from the bowels, by producing strong purging; and some finally increase the tone of the digestive organs, and thereby obviate that condition of the stomach and bowels which appears to favor the generation and nourishment of these animals.

There are five species of worms generated in the intestinal canal. The tænia solium; the tænia lata; the trichocephalus or trichuris; the ascaris vermicularis, and the lumbricoides.

The *tænia*, or tape-worm, is a long tape-like worm, "formed of a chain of flat articulations, united together by means of a border or edge varying in breadth or thickness." These links or articulations are possessed of independent vitality, and capable of becoming distinct worms, when left in the intestinal canal.

The tænia occasionally grows to an amazing length. Brera speaks of one, preserved in the cabinet of the University at Pavia, which exceeds two hundred and thirty feet. There are two species of tænia: the tænia cucurbitina, or *armed* tape-worm, and the tænia lata, or unarmed tape-worm. The former of these species is found exclusively in the human subject. It is very difficult to dislodge it from the bowels, in consequence of the power it has of insinuating itself into the mucous membrane of the intestines, by means of two small fangs or crotches with which its head is armed, and from which it derives its specific name.

This species of tænia is rarely discharged entire; it usually comes away in small pieces, or in single joints, resembling the seeds of the gourd. The tænia lata is not furnished with the fangs which characterize the other species, and is, therefore, much more easily expelled than the armed one.

The *trichocephalus* or *trichuris*, is but very seldom found in the human intestines. It was first described by Dr. Wagler, a German writer, about the middle of the last century, who found it in the cæcum of some French soldiers, who had died of a contagious epidemic at Gottingen.* It is a very thin spiral worm, from an inch and a quarter to two inches in length. The external surface is marked by a great number of transverse lines, like rings. "One part of the body terminates in a filamentous elongation, as fine as a hair, and coiled round in a very surprising manner; the other part, turning in a spiral form, most commonly terminates in a hook, broad and obtuse, and similar to the pistil of the liliaceous flowers. From this extremity the worm can put forth a sort of tube enveloped in a sheath." It is commonly found in the cæcum or ileum.

The *ascaris vermicularis* or ascarides, are an exceedingly common worm, and are often discharged in astonishing numbers. They are round, thread-like, very slender, and not more than from a quarter of an inch to an inch in length. They skip and move with very great vivacity, and when touched contract to nearly half their length. The ascarides reside in the large intestines, and are commonly most abundant in the rectum just within the anus. They are also occasionally discharged from the stomach. Brera states that he found several masses of ascarides in the œsophagus of a woman who had died of a nervous fever. He states, too, that this worm is sometimes found in the vagina of women, giving rise to much vaginal irritation, and leucorrhœal discharges. "The ascarides live longer than any other in the human body. It can exist an almost incredible space of time. The nature of the aliment which supports this worm has been the subject of various opinions. But it has at length been observed that the mucous matter which lubricates the intestines and the vagina of women is the substance for which it has the strongest predilection. Agreeably to this, it is not wonderful that we find the ascaris vermicularis in other parts of the body in which the mucous fluid abounds, as the bladder, stomach, œsophagus, &c."†

The *lumbricoides* bear a strong resemblance in shape to the common earth-worm, and they were, by Linnæus, regarded as

* Brera's Treatise on Verminous Diseases, p. 44.

† Ibid., p. 50.

belonging to the same species. This worm is white, sometimes of a flesh color, and commonly about the thickness of a goose-quill, and perfectly round. "The canal which passes through the abdomen of the worm is yellow and transparent," which some regard as a characteristic sign of this species. Its length is from four to twelve inches. Worms of this species are generally situated in the small intestines, but not unfrequently also in the stomach, and occasionally in the colon and rectum. "When they have once passed the valve of Bauhin," says Brera, "we may consider them as destroyed." They are generally soon evacuated after having passed into the lower intestines. Children are particularly subject to the lumbricoides; and they are often discharged, even by very young subjects, in great numbers. They are sometimes discharged collected together into round balls.

Worms are capable of producing great disturbances in the system. Not only do they aggravate ordinary diseases, when they are present, but they also give rise to a great variety of very alarming and anomalous affections. The whole train of spasmodic and convulsive diseases may proceed from the irritation of worms in the alimentary canal. Chorea, epilepsy, catalepsy, tetanus, paralysis, mania, convulsions, as well as a variety of other nervous and convulsive affections, are not unfrequently the immediate effects of this cause. Besides these diseases, worms have also been known to produce pleuritic and rheumatic pains, dysentery, remitting fever, hydrocephalus, consumption, chronic and spasmodic cough, &c. &c. But I must refer the reader to the works on practice, and particularly to Brera's excellent treatise on verminous diseases, for a full account of the morbid effects of intestinal worms.

Although we have no unequivocal signs of the presence of intestinal worms, except their actual discharge either from the bowels or stomach; yet there are certain symptoms which enable us to pronounce, with tolerable assurance, on their presence in the alimentary canal. Among these symptoms, the following are the most common and striking: a pale, leaden-colored, and occasionally flushed countenance; a bluish streak under the eyes; these are dull and heavy; the pupils are dilated, or very much contracted; the lower eyelids and upper lip tumefy, especially during the night while sleeping; frequent itching in the nostrils, which causes the patient to pick his nose; fetid breath; disturbed sleep, during which the patient grinds his teeth, is apt to lie on his belly, to scream out and start up suddenly, as if frightened; tingling in the ears; giddiness; interrupted speech; palpitation of the heart; muscular debility and flaccidity; pulse frequent, corded, and often intermittent; a dry and spasmodic cough; irregular and depraved appetite, being sometimes entirely suppressed, and

at others exceedingly voracious; abdomen swelled and hard; diarrhœa or costiveness; unnatural, slimy, and fetid stools; pricking and tearing pains in the bowels; emaciation; convulsions; paralysis, &c.

The above symptoms may be considered as common to all the species of worms that have been mentioned. There are others, however, which are peculiar to some of these species separately, and which it will be proper to advert to in this place.

A pricking and rending pain in the umbilical region; colic, with a rumbling noise in the belly, may be considered as symptoms peculiar to the lumbricoides. This worm is capable of perforating the intestines with the sharp cutting point of its head; and its efforts to insinuate itself into the mucous coat of the intestines are supposed to cause the pains just mentioned.

The symptoms which are peculiar to the ascarides are, an irritation and intolerable itching and pricking pain in the extremity of the rectum. These worms are usually found in conglobated masses, and although near the extremity of the large intestines, they are exceedingly difficult to remove entirely from their place of lodgment. They sometimes produce inflammation of the rectum, with bloody stools and tenesmus. Swelling and pain of the anus are, also, occasionally, observed as the effects of ascarides.

The symptoms of tænia, besides those which have already been mentioned, as common to the intestinal worms, are: a sense of weight and pain in the abdomen, accompanied with a burning motion of something alive in the bowels. "Occasional prickings, or rather bitings, are felt in the region of the stomach, the abdomen swells at intervals, and then subsides almost by undulation; a sense of cold from time to time pervades the abdominal viscera. The appetite is usually uncommonly great; the complexion is livid, and the patient is frequently faint; the pupils are unusually dilated; vertigo confuses the head of the patient, and excites vomiting; the legs vacillate, and sometimes the whole body seems to be affected with convulsive trembling. Often small substances resembling the seeds of a lemon or gourd, are evacuated with the feces of the patient, which are portions of the marginal papillæ of these worms." It is stated also, by authors, that persons affected with tænia are apt to become uneasy and ill whenever they hear music, particularly the music of an organ at church.*

* Brera's Treatise on Verminous Diseases, p. 147.

PARTICULAR ANTHELMINTICS.

SPIGELIA MARILANDICA.—PINK-ROOT.—CAROLINA PINK.

This plant is indigenous to the southern parts of the United States, where it is found in great abundance. It has a perennial root, consisting of numerous fibrous branches, of a yellowish color when first dug out of the earth, but becoming black on being dried and long kept. The stalk is herbaceous, and grows to the height of from six inches to two feet. Spigelia possesses a sweetish, slightly bitter, and somewhat nauseous taste. According to M. Feneuille's analysis, the root contains a fixed and volatile oil, a small portion of a resin, a bitter substance, in which the vermifuge or active principle of the root is supposed to reside, a mucilaginous saccharine matter, albumen, gallic acid, malate of potassa, and lime, and woody fibre. The bitter active principle is a brown substance, of a bitter and very disagreeable or sickening taste, "like that of the purgative matter of leguminous plants. It appears to possess some narcotic powers; for, when taken internally in full doses, it gives rise to a feeling of intoxication, great fullness in the vessels of the head, ringing in the ears, and vertigo. Water extracts its active principles."*

The pink-root is esteemed as a very valuable vermifuge. Its anthelmintic properties, however, are almost entirely confined to the long round worm, possessing little or no powers in destroying or removing the other species of intestinal worms. It was first introduced into regular practice by Drs. Lining,† Garden and Chalmers, of South Carolina, and it is now more frequently prescribed in this country for the expulsion of the round worm than any other anthelmintic we possess. The whole plant possesses anthelmintic properties; the root, however, is by far the most powerful portion of it. Spigelia is much more active in its recent state than when old; by very long keeping it loses nearly all its active qualities.

Dr. Thompson‡ took large doses of this root, and found it to produce acceleration of the pulse, flushed face, drowsiness, and a sensation of stiffness of the eyelids. It is now ascertained beyond a doubt, that this root possesses narcotic powers, capable of producing unpleasant and even alarming symptoms, when taken in

* Bigelow's Medical Botany, vol. i. p. 144.

† Essays and Observations on Physic and Literature, vol. iii. p. 151.

‡ An Inaugural Dissertation on the Spigelia Marilandica, by Hodge Thompson. Philadelphia, 1802.

very large doses. I once had a little patient, in the commencement of my practice, to whom I administered this medicine in very large and frequent doses, and the effects were such as clearly demonstrated its narcotic powers. The child, a boy about six years old, after having taken three or four gills of a strong decoction of the root, was suddenly affected with complete mental derangement. The derangement was precisely of the kind sometimes produced by the seeds of stramonium. He was affected by alternate fits of laughing and crying, ran and skipt about the room incessantly and distorted his countenance in a frightful manner. The pupils of his eyes were greatly dilated, and his talk was wild and incoherent. These symptoms went off in the course of about twenty-four hours, and left him quite as well as he had been before he took the pink root. I have, however, since prescribed this medicine in a great number of instances, and have not, except in one case, seen any ill effects from it, and in this instance it only produced slight giddiness, with dimness of sight, and dilatation of the pupils.

The pink root may be given either in powder or in decoction. The latter mode of using it is, however, the preferable one, as the medicine is much more rapidly and equably diffused through the intestinal canal when in a liquid form than when given in powder. The powder is given to children in doses of from ten to twenty grains. A pint of the decoction made from an ounce of the root should be given in the course of four, five, or six hours. It is usual to combine senna with the pink-root in order to procure the expulsion of the worms as soon as they have been destroyed or weakened by this anthelmintic. It is better, however, to give the spigelia by itself; and to exhibit a strong mercurial purge immediately after the medicine is taken. Given in this way it will seldom fail to bring away worms, if there are any present. The pink-root possesses purgative properties; but these are both uncertain and feeble.

Formulæ.

℞.—Rad. spigeliæ ʒiii;
Pulv. sem. santonicæ ʒii;
Flor. sulph. ʒiv;
Ol. chenopodii anthelm. gtt. x;
Syrupi communis q. s. ut fiat electuar. Take a teaspoonful three times daily.

℞.—Rad. spigeliæ ℥i;
Fol. sennæ ʒi;
Sem. santonic. ʒii;
Rad. valerian. ʒii;
Aq. bullient. ℥x. Simmer down to ℥vi. Give a tablespoonful every two hours to a child from two to five years old.

During the last few years I have employed the following compound decoction, with peculiar success, for the destruction and expulsion of lumbricoides.

℞.—Rad. spigeliæ ℥i;
Conferv. helminthocort. ℥iii;
Sem. fœnicul. ℥ii.—M. Boil from a pint of water down to half a pint, and let the whole be used in a day.

MELIA AZEDARACH.—THE PRIDE OF CHINA.

This beautiful and stately tree was originally brought from Japan, and is now naturalized to most of the countries of Europe, and to the southern parts of the United States.

It appears from the testimony of some of our southern physicians, that the fresh bark of the root of this tree possesses very active anthelmintic properties. Dr. L. Kollock, vice-president of the Georgia Medical Society, speaking of the vermifuge powers of this tree, says: "It is a vermifuge of efficacy. Its use is, in some measure, general among the planters, and with many supersedes the use of all others. I have given it with success where all others in common use have failed of relieving. But when given in the months of March and April, while the sap is mounting into the tree, it has sometimes been followed by stupor, dilatation of pupil, stertorous breathing, subsultus, &c. But these symptoms, like those sometimes produced by spigelia, pass off without any perceptible injury to the system. This article, like the spigelia, is also a useful febrifuge medicine, in those affections usually denominated verminous fevers, but where no worms are voided. The common form is that of decoction. A large handful, say about four ounces, of the bark of the fresh root, is boiled in a quart of water, till it acquires the color of strong coffee, *i. e.* to about a pint, of which from half an ounce to an ounce may be given every two or three hours till it operates. Given in this manner its operation is powerful, sometimes producing both vomiting and purging." The late Professor Barton had a very high opinion of the vermifuge powers of this tree. He considered it as the most active anthelmintic with which we are acquainted.* The berries have also been employed with success as an anthelmintic. Children are suffered to eat them, "without any particular regard to the dose," and it is stated by some, that they are quite as efficacious as the bark of the root. The pulp of the fruit made into an ointment with lard, has been employed with success in tinea capitis.†

* Collections for an Essay towards a Materia Medica of the United States, p. ii. p. 53.

† Thacher's Dispensatory, p. 283.

CHENOPODIUM ANTHELMINTICUM.—JERUSALEM OAK.

This is a native of Buenos Ayres, and of different parts of the United States. It has been much praised for its anthelmintic power, and from no inconsiderable experience with it, I am fully satisfied that it is worthy of very considerable attention as a vermifuge. The leaves and stalks are bitter, and possess an aromatic acrimony. Every part of the plant is endued with active properties, but the seeds are decidedly the most powerful. The juice of the fresh leaves is occasionally employed in the dose of a tablespoonful two or three times a day, for children under five years old. Given in this way, however, it is exceedingly unpleasant, and very few children can be induced to take it. I have employed the juice in a few instances with much advantage. The best, and, indeed, usual form for giving this remedy, is the powdered seeds, made into an electuary, with syrup. From twenty to forty grains of the seeds may be thus taken two or three times a day, by a child four or five years old. It is usually directed to be given early in the morning, before eating, and again in the evening some hours after supper.

The seeds of the chenopodium contain an essential oil, which has been lately much recommended, in cases of worms. It is, indeed, an exceedingly active vermifuge; I have in many instances, succeeded in expelling numbers of lumbricoides with it, after various other anthelmintics had repeatedly been tried in vain. A child two or three years old may take from three to eight drops twice a day mixed with a good deal of sugar or mucilage. After it has been given for three or four days, some brisk purgative medicine should be administered. The oil, like the expressed juice, is very offensive, both to the taste and smell, and this forms a very great obstacle to its employment with children. Where it can be regularly given, however, it is unquestionably one of the best anthelmintics of which we have any knowledge.

The *Chenopodium Ambrosioides*, another American species of this genus, bears considerable resemblance to the preceding species, and is not unfrequently mistaken for it. It may be known from the C. anthelminticum by its racemes being furnished with a number of small leaves crowded along the common peduncle. It possesses considerable anthelmintic properties, but is inferior, in this respect, to the C. anthelminticum. I have, nevertheless, employed it in a few instances with manifest vermifuge effects.

Formulæ.

℞.—Ol. chenopod. ʒi;
Sacch. alb.,
G. Arab., āā ʒi.—M. dein adde, aq. menth. sativ. ℥iii. Dose a tea-

spoonful four or five times daily, for three days in succession: after which a full dose of castor oil is to be administered.,

℞.—Sem. chenopod. anthelm.,
Rad. spigeliæ, āā ℥ss;
Fol. sennæ ℥i;
Sem. fœnicul. ℥ii.—M. Boil from a pint of water, down to half a pint. Let the child take a tablespoonful, every hour or two, until the whole is taken.

GEOFFRÆA INERMIS.—CABBAGE TREE.

The bark of this tree, a native of Jamaica and other West India islands, has been lately introduced into notice as a vermifuge of great powers. It is of a gray color externally, and of a dark-brown or black and furrowed appearance on the inside. It has a sweetish and mucilaginous taste, and a pretty strong unpleasant smell.

This article is prescribed either in the form of powder, or decoction, or of extract. The decoction is, however, most commonly employed. It is made by boiling one ounce of the bark in a quart of water, till it acquires the color of Madeira wine. Brera states that it is more efficacious when it is combined with valerian. He says that he has employed it with great efficacy against lumbricoides and ascarides.

When given in full doses, it often produces nausea, and occasional vomiting. If the dose is too large, its effects are sometimes very violent, producing strong vomiting and purging, delirium and fever. It should, therefore, always be commenced with in small doses; and when carefully administered, it is said by those who have tried it, to be a very powerful vermifuge. It is more particularly useful for the expulsion of the lumbricoides. Of the decoction two tablespoonfuls may be given to an adult two or three times a day; the powdered bark is given in doses of about half a drachm; of the extract from three to four grains are considered a full dose. It is said, by some, that cold water, drank during the employment of this remedy, is apt to occasion very alarming effects. When fever, delirium, or other disagreeable effects arise from its use, relief may be obtained by drinking warm water, vinegar, or castor oil.

DOLICHOS PRURIENS.—COWHAGE.

This plant grows in considerable abundance in the East and West Indies. It bears pods, thickly beset on the outside with

stiff hairs, which, when applied to the skin, occasion a most intolerable itching. These hairs, by their mechanical action on worms, penetrating them like little spears, become a safe and effectual anthelmintic. It appears that this article is equally useful against every species of intestinal worm. When used for the expulsion of the tape-worm, it ought, however, to be given in at least double the quantity which is usually directed in cases of lumbricoides. In cases of ascarides, I have, in some instances, employed this article with much benefit. Against whatever species of worm it be employed, however, it should always be preceded by one or two cathartics, as its efficacy is commonly much increased by this practice, probably by exposing the worms more to the action of this substance. The proper mode of giving the cowhage is to mix it with molasses or syrup, into a thick electuary. Of this a teaspoonful may be given to a child two or three years old, and repeated in the morning and evening for three or four successive days. The dose for an adult is a tablespoonful of the electuary. It appears to be quite a safe remedy, and I am persuaded, from my own experience, that it is often very effectual. Mr. Chamberlain says, that one of his children, about five years old, "took by stealth, three or four ounces of the syrup of cowhage, without any other inconvenience than a diarrhœa, which did her more good than harm."*

The root of this plant is said to possess very valuable diuretic properties; and a vinous infusion of the pods (12 to a quart) is stated to be a certain remedy for dropsy.† Dr. Collier, of London, in a late number of the London Medical and Physical Journal, proposes scattering some of the pubes dolichi prurientis over the body, for the purpose of rousing the system in cases of poisoning by narcotics. The effects are said to be sudden and powerful.

Formula.

℞.—Spicular. dolichi ʒss;
Mellis q. s. ut fiat electuar. Dose, a teaspoonful for a child from two to five years old, taken twice daily, on an empty stomach, for three days in succession, and followed by a full dose of castor oil.

ARTEMISIA SANTONICA.

The seeds of this plant are an excellent anthelmintic. They have a bitter and subacrid taste, and a moderately strong and disagreeable odor. They contain a large portion of an essential oil, upon which their activity appears entirely to depend.

* Thacher's Dispensatory.

† Coffin's translation of Brera's Work on Verminous Diseases.

They are prescribed in substance, in infusion, in the form of an electuary, and in that of an extract. The dose for children under five years is from six to ten grains, and for adults from two scruples to a drachm, two or three times a day. The following is an excellent formula for giving these seeds: "Take an ounce of pulverized semina santonicum; and of black sulphur of mercury, resin of jalap, and of powdered cinnamon bark, three scruples; white sugar seven ounces; dissolve these in water, and boil to a consistence; mix the whole, and form the mass into boluses; the dose for a child is from one to two drachms."

Formulæ.

℞.—Pulv. sem. santonic. ʒii;
Pulv. jalapæ ʒss;
Calomel gr. v.—M. Divide into ten equal parts. Take one every three hours.—(For children between two and five years old.)

℞.—Sem. santon. gr. xx;
Rad. rhæi gr. xii;
Aloes gr. vi;
Calomel gr. iii;
Rad. ipecac. gr. i.—M. Divide into three equal parts. One to be taken on an empty stomach in the morning.

℞.—Pulv. sem. santonic. ʒss;
Pulv. rad. valer. ʒii;
Pulv. rad. jalap. ʒss;
Sulph. potassæ ʒii;
Oxymel. scillæ q. s. ut ft. electuar. A teaspoonful is to be taken three times daily. This is Bremser's celebrated *anthelmintic electuary*.

POLYPODIUM FILIX MAS.—MALE FERN.

The root of this fern has been long celebrated as an efficacious anthelmintic. Pliny,* Theophrastus, and Galen,† prescribed it against tænia and lumbricoides; and it is still considered by many practitioners as a remedy of very important vermifuge powers. Its employment is, however, at present almost exclusively confined to cases of tænia; and there is much testimony extant of its efficacy against this species of worm. The powder of this root forms the basis of the celebrated specific of Madame Nouffer.‡

* De Simplici Medicina, lib. viii.

† Opera, lib. xxviii.

‡ The secret of this remedy was purchased by Louis XV. of France. The following are the directions given for using it:—Take three drachms of the

When administered in substance, it is given in doses of from one to three drachms, followed by a full dose of some active cathartic. In this way I have employed it in four or five instances, but never with any advantage. I have, however, known it to be used with perfect success in the practice of other physicians. The French commissioners who were appointed to examine the remedy of Madame Nouffer, assert that it will not destroy the armed tænia. Brera and others, however, contradict this statement. "I have had several patients attacked by armed tænia," says Brera, "who were happily cured by this remedy." He states, in a note, that he cured seven patients affected with armed tænia by Noeffer's method. Herenschwand, a German physician, had employed the male fern before Madame Nouffer's secret was known, in a way very similar to her method. His mode of using this remedy is to administer two drachms of the male fern-root two successive mornings and evenings, and on the third day a cathartic composed of "twelve grains of gamboge, thirty of carbonate of potass, and two grains of turpentine soap, dissolved together in a cup of water." Three hours after, an ounce of ol. ricini is to be given, and repeated in an hour; if the worm does not come away, another dose of the castor oil must be given in two hours after. "But, if the worm be still not discharged, a clyster of equal parts of milk and water, and three ounces of oleum ricini must be injected towards evening, by which means the worm will come away entire and with ease." This plan of treatment has been found very efficacious by some physicians.

PUNICA GRANATORUM.

The bark of the pomegranate tree was a favorite anthelmintic with the ancient Roman physicians. Celsus prescribed it for the expulsion of tænia, and evidently placed much confidence in its powers. "Si lati sunt vermes," he says, "aqua potui dari debet, in qua lupinum, aut cortex mori decoctus sit; aut cui adjectum sit contritum vel hyssopum vel piperis acetabulum, scammoniæ

root of the filix mas, reduced to a powder, mixed with four or six ounces of water. The whole is to be taken by the patient, in the morning, on an empty stomach. For children the dose is lessened to one drachm of the powder. If this produces nausea, the patient must inhale the odor of strong vinegar. Two hours after the powder is taken, the patient is to take the following bolus: submuriate of mercury, dry resin of scammony, of each twelve grains, and five grains of gamboge; let them be finely powdered and formed into a bolus, and taken at one dose.

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 decoquet, donec tertia pars supersit; huic adjiciat nitri paulum et jejunus bibat.* Interpositis deinde tribus horis, duas potiones sumat talis aquæ vel muriæ duas huic adjectæ; tum desideat, subjecta calida aqua in pelve." Aretius also recommends the use of this bark as a very efficacious remedy for the removal of tænia.

It is remarkable that so valuable a remedy as this appears to be, should so long have been wholly neglected, or rather unknown by the profession. About twenty years ago, Dr. Fleming, in his Catalogue of Indian Medicinal Plants, mentioned this article as a powerful vermifuge. Dr. Pollock afterwards published a case of tænia in an infant, in which this article was employed with complete success * Quite recently, the favorable accounts which had been published of this remedy in tænia have been amply confirmed by P. Breton, Esq., surgeon to the Rhamgur battalion in the East Indies. He relates eight cases which were promptly and completely relieved by this medicine. In almost every instance the tænia was expelled, entire and alive, in the course of from three to six hours after first taking the remedy. He employed it both in the form of decoction and of powder. The former he made by boiling two ounces of the bark in a pint and a half of water down to three-fourths of a pint. Of this he gave a wineglassful every half hour, until four or five doses were taken. Of the powdered bark he gave twenty grains every hour, four or five times repeated. The remedy is apt to occasion nausea, and occasionally, also, when taken in strong doses, giddiness and faintness. When these effects ensue, the use of the medicine should be suspended for a time. "The temporary suspension and renewal of the medicine," says Mr. Breton, "may be successfully adopted under such circumstances."† Dr. Ruggia, a Neapolitan physician, has employed this remedy with great success; and Dr. Mile informs us that in a number of instances he has succeeded completely in removing tænia with this article. Dr. Mease, of this city, prescribed it in a case with the happiest effect; and I have heard of other instances of its successful employment in this country. Since the last edition of this work was published, I have prescribed this root in a case of tænia, with a highly satisfactory result. A worm of about eight feet in length was brought away in two pieces, and the patient has ever since been entirely free from his former distressing sensations.

* Medico-Chirurgical Transactions, vol. xi.

† Edinburgh Med. and Surg. Journ., vol. x. p. 419.

CAMPHORA.—CAMPHOR.

Camphor has been a good deal prescribed as an anthelmintic. Brera and others extol it very highly. "Of all the remedies for the expulsion of the lumbricoides," says Brera, "there is no one, according to my observations, which is more active or more certain than camphor. This substance, administered according to rule, expels lumbricoides with facility and promptitude, and at the same time strengthens the intestinal tube and the whole body."* Pringle states that he found this remedy very efficacious in verminous diseases; and Moscate, as we are informed by Brera, generally preferred camphor to other anthelmintics in cases of lumbricoides. "The employment of camphor," says Brera, "is also attended with this precious advantage, that it counteracts the predisposition to the further development of verminous seeds. I have always used it with great success, and I cannot too strongly recommend its use to physicians in worm complaints."† Camphor has also been used with success against tænia. Vogel expelled one of these worms of great length by administering camphor in the form of pills and in enemata.

Camphor is most conveniently given in the form of an emulsion with gum Arabic and sugar. By triturating camphor with carbonate of magnesia, we greatly increase its solubility in water. Two or three grains may be thus dissolved in an ounce of water, and if sugar be added to this solution, it forms an elegant and efficacious medicine in the worm affections of children. It is sometimes given in combination with assafœtida, semen santonica, valerian, &c.

The dose of camphor varies from one grain to thirty, according to the age and strength of the patient.

OLEUM TEREBINTHINÆ.

A great deal has lately been said concerning the vermifuge powers of the spirit of turpentine. Its efficacy in the expulsion of tænia has been so frequently attested, that we can no longer doubt of its excellence in this respect.

On the continent of Europe, the spirit of turpentine has been for many years prescribed in verminous affections. In England and this country, however, its introduction into practice as a vermifuge, is of recent date. It was first noticed in England as a

* Treatise on Verminous Diseases, p. 299.

† Ibid., 199.

remedy against tænia, in a letter from Dr. John R. Fenwick, of Durham, to Dr. M. Bailie, and published in the Medico-Chirurgical Transactions for 1811. Three cases are mentioned by Dr. Fenwick, in which the turpentine was successfully administered. Many other cases have since been related in the periodical journals, which demonstrate the powers of this remedy against tænia. When employed for the expulsion of this worm it should be given in large doses. From one to three ounces are commonly administered at once. Before the turpentine is taken, the bowels should be freely evacuated by some active purgative medicine. "Whatever quantity it may be thought proper to give at one trial of the remedy should usually be given in one dose. Three ounces of the spirit of turpentine taken at once will be more likely to destroy the worm or worms, than the same quantity taken one-third at once, repeated after an interval of one, two, or three hours, and will be much less tedious to the patient."* When given in large doses, it generally passes through the bowels in a short time, and is consequently less apt to be absorbed, and to affect the urinary organs, than when employed in small doses. If it does not move the bowels three hours after it is taken, a large dose of castor oil should be given. Dr. Coffin says, that as soon as it begins to be discharged per anum, "whether the worm appear or not, the patient should be permitted to drink freely of any bland suitable liquid." The turpentine is also an active remedy against the lumbricoides. When employed for the destruction of these worms, however, it may be given in much smaller doses than is necessary for the expulsion of tænia.

Dr. Klapp, of this city, in a paper on worms in the stomach, adduces a number of examples of the value of this remedy as a vermifuge. He gave it in doses of from twelve to fifteen drops every four, five, or six hours, occasionally interposing a mercurial cathartic.† It acts with peculiar advantage when the worms are situated in the stomach. In several instances of verminous affections, attended with a dull pain in the epigastric region, sickness of the stomach after eating, vertigo, a dry, short cough, foul breath, and an occasional choking sensation in the throat, I have administered turpentine in doses of from fifteen to twenty drops, continued for three or four days, and with complete success. The worms, under the use of this remedy, are usually discharged in a dissolved state. Under the head of Stimulants, I shall again have occasion to speak of this article.

Many other vegetable substances have been recommended for their vermifuge powers. Of these the following are the principal:

* Coffin's Translation of Brera's Treatise on Verminous Diseases, p. 250.

† American Medical Recorder, vol. iii. p. 155.

allium cepa, angelica assafœtida, juglans regia, tenacetum vulgare, valeriana officinalis, veratrum sabadilla, caria papaya.

According to Schmucker, the veratrum sabadilla is a very powerful vermifuge: it is, however, apt to produce violent symptoms, particularly severe vomiting, and ought, therefore, to be employed with great caution. Garlic also possesses strong anthelmintic properties. Taken on an empty stomach in the morning, in the form of decoction, it seldom fails to expel lumbricoides, if any be present.

For the expulsion of ascarides, anthelmintics ought to be administered both by the mouth and in the form of injections. Clysters are, indeed, indispensable in cases of this kind. Aloes dissolved in water, and thrown into the rectum, is an excellent remedy against these worms. The infusion of semen santonica is also highly recommended for this purpose. Mr. C. M. Clark says, "a strong decoction of the sem. santon. is the most efficacious of all the injections in use."*

A very effectual mode of destroying these worms is to introduce a large bougie, or tent, into the rectum, smeared with mercurial ointment. Dr. Coffin says, that a friend of his who suffered violent irritation in the rectum from these worms, obtained complete relief by introducing a bougie covered with whale oil into the rectum.

I have, in several instances, succeeded in bringing away a large mass of ascarides, by injecting a solution of saccharum saturni, in the proportion of a drachm to eight ounces of water.

STANNUM.—TIN.

Tin is a remedy of considerable powers as an anthelmintic. Of its efficacy against tænia, as well as against the lumbricoides, there is abundant evidence extant. Alston, a Scotch physician, was the first who prescribed it for the expulsion of tænia.† Dr. J. Fothergill also speaks in high terms of its powers against this worm. He recommends an ounce of the filings to be given for six days in succession, and a purgative to be taken on the seventh.‡ Brera observes that in cases of old, large-armed tænia, he has known the method of Nouffer to be ineffectual, and that in these instances the filings of tin, regularly administered, produced the desired effect with promptness. Tin appears to be most efficacious when given in the form of filings. These are given in

* Diseases of Females, p. 109.

† Med. Essays and Observations, by a Society at Edinburgh, vol. v. p. 87.

‡ Medical Observations and Inquiries, vol. vi. p. 71.

doses of from half a scruple to an ounce, formed into an electuary with honey or syrup. They should be continued for several days, and occasionally suspended for the purpose of interposing a purgative. Brera says that he has used this metal in the form of Guy's powder of Ethiopia, with great success.* He observes, also: "The aurum musivum is one of the most efficacious remedies employed against tænia, particularly the armed tænia. This preparation, more active than the powder of Guy, ought to be thus compounded:—Melt twelve ounces of very pure tin, and add to it three ounces of mercury; let the mixture cool, triturate it in a mortar, to a very fine powder; while triturating the mix-

* The following are the directions given for making this powder:—"Take seven ounces of pure rasped tin, an ounce of mercury, a drachm of sublimed sulphur, triturate the whole thoroughly in a mortar to a very fine powder. The dose is from twenty to thirty grains twice a day." Tin forms a principal part of the vermifuge of Matthieu. This man received the title of counsellor of the court, as well as a large pension for life, from the King of Prussia, for making known his method of expelling tænia from the bowels. This remedy consists of two electuaries; the first marked A, the second B.

"*The First Electuary*, A.—Take an ounce of very fine English tin filings, six drachms of the root of the polypodium filix mas, half an ounce of semen santonica, a drachm of the resinous root of jalap, and of sulphate of potass, and of honey sufficient to make an electuary.

"*Second Electuary*, B.—Take two scruples of the pulverized resinous root of jalap, and of sulphate of potass, one scruple of scammony from Aleppo, ten grains of gamboge, and of honey sufficient to form an electuary.

"Those who may be inclined to adopt this method to expel tænia must observe the four following rules:

"1. For some days previous the patient is to be confined to a suitable diet, that is, he is to eat salted substances—for example, herrings, light porridges and broth, and leguminous articles.

"2. The treatment is begun by administering to the patient, every two hours, a teaspoonful of the electuary A. This course to be continued two or three days, till the worm is perceived to be in the intestines, and then,

"3. The patient is to take electuary B, and of this he also takes, every two hours, a teaspoonful, till the worm is expelled.

"The discharge of the worm is facilitated by taking some spoonfuls of fresh oleum ricini, or by some clysters of the same oil.

"4. The age, sex and temperament of the patient may require a considerable modification of the dose of these remedies; for this reason the treatment ought to be directed and modified by a well-informed physician.

"Finally, it is to be borne in mind, that the virtue of the electuary A depends, in great part, on the root of the polypodium filix mas; hence this root should be fresh, and its internal hard part only should be reduced to powder.

"This powder will have a reddish color. See *Hartenkeil, Medicinisch-chirurgische Zeitung*, 1800, 2 *Band.* p. 293."

ture, add seven ounces of sublimed sulphur, and three ounces of muriate of ammonia. The dose is ten grains twice a day."*

HYDRARGYRUS.

Mercury possesses the power of destroying intestinal worms, and has been much employed by physicians for this purpose. Formerly water boiled on mercury was recommended as a remedy against the lumbricoides. Many reports have been made in favor of its vermifuge powers when administered in this way; but as mercury seems to be entirely insoluble in water, the decoction is now entirely neglected as an inert remedy. Calomel, however, is certainly a very useful anthelmintic.† Given in minute and repeated doses, it seldom fails to destroy the lumbricoides. Were it not for its tendency to affect the mouth, it would be a very important vermifuge for children, as it may be more conveniently administered than any other medicine.

To children, from one-fourth to half a grain may be given night and morning, for three or four days, and a purgative given when the medicine is discontinued. The corrosive sublimate has also been prescribed as a vermifuge; but its extremely unpleasant taste renders it difficult to give to young patients. The ammoniacal muriate is said to be a very efficacious form for

* Treatise on Verminous Diseases, p. 344.

† Many of the nostrums advertised for the cure of worms, contain calomel as their principal ingredient, combined with scammony, jalap, gamboge, or some other purgative; they are uncertain and dangerous medicines; the method of exhibiting them in the form of lozenges, (*worm cakes,*) is also attended with inconvenience, for the sugar and the gum generating an acid, by being kept in damp places, may considerably increase the acrimony of the mercury; besides which, the calomel is frequently diffused very unequally through the mass; one lozenge may, therefore, contain a poisonous dose, whilst others may scarcely possess any active matter.

"*Ching's Worm Lozenges.*—These consist of *yellow* and *brown* lozenges; the former are taken in the evening, the latter the succeeding morning.

"*The Yellow Lozenges.*—Saffron ℥ss; water Oj; boil and strain; add of white panacea of mercury (calomel washed in spirit of wine) ℔i; white sugar ℔xxxviii; mucilage of tragacanth as much as may be sufficient to make a mass, which roll out of an exact thickness, so that each lozenge may contain one grain of panacea.

"*The Brown Lozenges.*—Panacea ℥vii; resin of jalap ℔iiiss; white sugar ℔ix; mucilage of tragacanth q. s.; each lozenge should contain half a grain of panacea.

"*Story's Worm Cakes.*—Calomel and jalap made into cakes and colored by cinnabar."—*Paris's Pharmacologia.*

giving this remedy. The sulphate and sulphuret of mercury have also been recommended as useful against worms. The mercurial preparations are frequently given in combination with other vermifuges.

There are many other mineral substances recommended in the books as possessing useful anthelmintic powers. The principal of these are, arsenic, sulphur, iron, muriate of barytes, muriate of ammonia, and muriate of soda.

SECONDARY ANTHELMINTICS.

SEM. SABADILLÆ.

The seeds of the Veratrum Sabadilla are highly extolled by Schmucker for their vermifuge powers; and Thilenius declares that they are decidedly the most efficacious in this respect of all the anthelmintic remedies we possess. Kausch, also, (Med. and Chirurg. Observat.,) has published some observations illustrative of the excellent effects of these seeds in verminous cases. It should be observed, however, that they possess active *narcotic* properties, and when administered in over-doses, often excite very alarming affections, such as a burning pain in the œsophagus, nausea, vomiting, abdominal pains, painful diarrhœa, subsultus tendinum, and great prostration of strength. In enormous doses they excite vertigo, delirium, and even convulsions. Violent as their effects are when given in over-doses, they may, nevertheless, be safely employed when given in proper portions. Schmucker gave half a drachm* of the powdered seeds mixed with the same quantity of sugar, in the morning; on the following morning the same dose was administered; and if, after the second dose, no worms were discharged, he continued its use by giving daily fifteen grains, both morning and evening, interposing an active purgative every fifth day. By this course of management we are assured he invariably succeeded in procuring relief in verminous affections.

The sabadilla seeds have also been strongly recommended as a remedy in chlorosis, melancholia, and epilepsy. A peculiar active principle has been obtained from these seeds, to which the name of *sabadillin* has been given. This substance ranks with the acrid poisons; and Pfaff (Mat. Med. vol. vii. p. 228), calls it "the white vegetable arsenic."

The plant from which these seeds are obtained is a native of

* This is the dose for adults.

Mexico and of the Antilles. As this drug is met with in commerce, it consists of a mixture of capsules, peduncles, and seed. They have no odor, but are of a peculiarly acrid, bitter, and nauseous taste, leaving a disagreeable dryness in the fauces and throat, which lasts often for several hours.

CONFERVA HELMINTHOCORDON.—WORM-MOSS.

This sea-weed grows along the coast of Corsica. It has a saline and somewhat acrid taste, with little or no odor when dry. It does not appear to be a single species of *Fucus*, but consists of a number of small sea-plants of the family of *Algea*. It is said that upwards of twenty distinct species of algea have been found in this drug, as it is met with in commerce. It has been long used in Corsica as an anthelmintic; and although but very seldom employed in this country or in Europe for this purpose, my own experience has furnished me with several very striking instances of its efficacy. I have found it particularly valuable in those tedious cases of diarrhœa and intestinal irregularity which are occasionally met with in children, from verminous irritation. In what is usually called marasmus, that is, mucous diarrhœa, with a hard and tumid abdomen, pale, and sickly countenance, and emaciation of the extremities, I have known the most favorable effects to result from the use of this article. I have good reasons for believing that *Swaim's vermifuge nostrum* is prepared from this drug. The helminthocordon was, some years ago, (in 1822,) introduced to the notice of the profession by Mr. Farre, of London, (An Essay on the Effects of the Fucus Helminthocordon upon Cancer, Lond. 1822,) as a valuable remedy in cancerous and scrofulous affections. As it contains a small portion of *iodine*, it is not improbable that advantage may be derived from its use in scrofulous affections; but its efficacy in true cancer has not been confirmed. When given in *large doses*, this article acts on the bowels as a purgative; and it is said that after its daily use in such doses has been continued for ten or twelve days, copious stools of a black, viscid, tar-like substance are usually discharged from the bowels. To produce this effect the infusion must be of the strength of six drachms of the *conferva* to a pint of water, and given in wineglassful doses every six hours. Used in this way, it is said to have been entirely efficacious in scirrhous mammæ, and other glandular indurations. For verminous affections and marasmus in children, I have generally employed the infusion just named, in teaspoonful doses, every morning, noon, and evening. Its use should be continued for three or four weeks.

CHAPTER V.

ANTACIDS.

ANTACIDS are substances which obviate acidity in the alimentary canal. The action of these remedies is purely chemical, "as they merely combine with the acid present, and neutralize it."*

In a perfectly healthy state of the digestive organs, no acid is, perhaps, ever generated in the alimentary canal. As it, however, frequently happens even in the most temperate, that digestion is retarded or enfeebled, the aliment taken in is often subjected to chemical changes, producing acidity and flatulency. While these changes go on in a moderate degree, the system does not, in general, experience any particular inconvenience from them. When, however, the evolution of acid is great, or has become habitual, a train of various and distressing symptoms generally ensue.

Acid does not, however, always depend on a chemical change in the substances received into the stomach. It has, in fact, been well ascertained that this acid often differs radically from that which is formed by vegetable fermentation. It appears often to possess a peculiar character, depending, doubtless, on a morbid secretion in the stomach. Still, however, as the generation of acid in the primæ viæ is very frequently accompanied by the evolution of large quantities of air, it would appear to be pretty certain that fermentation does take place in the stomach and bowels, and that the acid often depends on this cause. "Acid," says Richter, "in the primæ viæ, is certainly of two kinds, arising from two different causes. It is sometimes plainly the consequence of a *corruptio spontanea*, of acids taken by the mouth, or of meat and drink which have become sour; and in this case it only incommodes the patient when he has taken such meat or drink; it is easily and constantly blunted by alkaline or absorbent medicines, and keeps away as long as the patient carefully uses *diæta antacida*. Medicines which strengthen the system, with an antacid diet, generally cure the patient of this acidity. But sometimes the patient is incessantly tormented with acid, eat what he will, even though he takes only animal food. None of the medicines which blunt acidity are of any service, or they only procure him a short mitigation. And in this case the acid is not the produce of a *corruptio spontanea*,

* Murray's Mat. Med.

but a *secretio perversa liquorum menstruorum.* The patient, as Kæmpf says, has a brewery of vinegar in his stomach."*

The secretion of uric acid by the kidneys, is much influenced by the presence or absence of acidity in the stomach. The habitual existence of acid in the primæ viæ is almost invariably attended with an abundant secretion of the uric acid; and hence we find alkaline remedies amongst the most useful means for counteracting the secretion of lithic acid by the kidneys.

The existence of acid in the stomach produces, in some, a very disagreeable itching in the skin. I have seen several persons who experienced a very troublesome itching in the skin whenever acid was formed in the stomach, and who invariably obtained relief from a dose or two of magnesia.

The connection between acidity in the stomach and gout, has often been observed. "Acid," says Dr. Scudamore, "when much accumulated in the primæ viæ, will always powerfully concur with the other causes to excite a fit, and will sometimes prove alone sufficient. I have met with several instances in which the discharge of acrid fluid from the stomach has produced immediate and very sensible relief."†

In infants, acidity in the bowels is very often the cause of much uneasiness and distress. Whenever the stools are of a grass-green color, we may be assured of the existence of acid in the primæ viæ. The bile in its natural state is not green, but of a pale yellow color. The green color which we may often observe it to possess in the discharges of infants, depends on the action of the gastric acid upon it. The efficacy of the common practice of giving cretaceous powders, when the stools have this grass-green appearance, depends chiefly on their property of obviating acidity.

LAPIDES CALCARIÆ, ET TESTACEA.

Calcareous substances are among the most useful articles of this class of remedies. Of these there are a great number, the most important of which are the following:

Creta Præparata.—This is a very useful antacid, and much employed in diseases of children depending on acidity and relaxation of the alimentary canal. It is, indeed, particularly serviceable in the chronic bowel-complaints of infants, whether acid be present or not. The usual mode of prescribing it is in union with gum Arabic, opium, cinnamon, catechu, &c.

* Medical and Surgical Observations, p. 190. See also the article Assafœtida, in this work.

† Scudamore on Gout, p. 57. Philad. edit.

Testæ Ostrearum.—Pulverized oyster-shells are an excellent antacid and absorbent. They are given with bitter or aromatic articles, in debility of the digestive organs, attended with sour eructations and other gastric affections arising from acidity. De Haen states, that he cured rachitis, by giving twice a day twenty grains of powdered oyster-shells. This article has also been recommended as very beneficial in the debility and dyspepsia which arise from excessive onanism.* It may be given in doses of from ten grains to two drachms.

Oculi Cancrorum.—These are small hemispherical calcareous bodies found on each side of the stomach of the *cancer astacus*, during the month of August. They consist of carbonate of lime and animal gelatine. They are slowly soluble in vinegar. This article has been much used in affections arising from acidity of the first passages. It has been recommended as particularly serviceable in disorders of the urinary organs, depending on this cause. I presume, however, that it is not superior, in this respect, to any of the other calcareous articles of this class. Gaubius and others recommended it as useful in leucorrhœa, especially when this complaint is accompanied with acid in the primæ viæ.† It has been stated by some German writers, to be apt to excite hemorrhages, and we are therefore cautioned against employing it where there is much disposition to hemorrhage. I have no idea, however, that there is any foundation for this opinion. This substance is given in doses of from twenty grains to a drachm.

The officinal calcareous preparations are: *mistura cretæ*, Lond. Ph.; *potio cretacea*, Edin. Ph.; *pulv. cretæ compositus*, Edin. Ph.; *pulv. carbonatis calcis compositus*, Edin. Ph.; *pulv. cretæ cum opio*, Lond. Ph.

Formulæ.

℞.—Extract. hyoscyam. gr. ss;
Lapid. cancror. gr. xx.—M. Divide into six equal parts. S. Give one every hour to a child of from two to five years old.

℞.—Pulv. cretæ compos. cum opio ℈i;
Pulv. catechu extract. gr. xv. This is a dose for an adult, and is an excellent remedy in recent diarrhœa.

℞.—Cretæ ppt. gr. xx;
Pulv. ferri phosphat. gr. vi;
Pulv. rhæi gr. x.—M. Divide into ten equal parts. I have found this a peculiarly useful combination in the bowel-complaints of infants. After the operation of a dose of rhubarb, one of these powders may be given every six hours, *provided no fever be present.*

* Burdach, Arzneimittellehre, vol. ii. p. 504.

† Shippers, über eine besondere würkung der krebsaugen beym weisen flusse—in Sammlg. auserl. Abh. xviii. B. I. 471.

℞.—Cretæ ppt. ʒiii;
Sacch. alb.,
Pulv. g. Arab., āā ʒiss;
Tinct. opii gtt. xl;
Tinct. kino ʒii;
Aq. menth. ʒvi.—M. S. Dose, a tablespoonful every two hours, in diarrhœa.

AQUA CALCIS.

Lime-water is an efficacious corrective of acidity in the first passages. In dyspepsia, attended with acid eructations, and in chronic diarrhœa, this article is often of great service. It is usually given with milk, in doses of from two to four ounces, three or four times a day. Of the various remedial powers of this preparation, and especially of its utility in counteracting the lithic acid diathesis, I shall have occasion to speak when I come to treat of Antilithics.

MAGNESIA ALBA.

Magnesia unites readily with the acid generated in the stomach, and is especially serviceable in all cases of acidity, attended with a torpid state of the bowels. Where, however, diarrhœa and a very irritable state of the intestinal canal exist, it is much less useful than the calcareous antacids already mentioned, since it acquires pretty active purgative qualities when united with an acid. In the bowel-complaints of infants, attended with green and griping stools, magnesia, combined with rhubarb, has long been a favorite remedy with practitioners.

CARBONAS POTASSÆ SODÆ.

The fixed alkaline salts are the most perfect neutralizers of acids. They have accordingly been much prescribed in affections attended with accumulations of acid in the stomach and bowels; as they are, however, much less pleasant, and not more efficacious, than magnesia, in the diseases which depend on this cause, a preference is generally given to this latter substance. In dysentery, attended with acid eructations, or other symptoms denoting acidity in the alimentary canal, the carbonate of potassa has been particularly recommended by Causland and Rademayer. Dr. Mitchell, of New York, also speaks highly of the alkaline medicines in this disease. The dose of these carbonates is from five to twenty grains.

CHAPTER VI.

B. MEDICINES WHOSE ACTION IS PRINCIPALLY DIRECTED TO THE MUSCULAR SYSTEM.

I. *Medicines calculated to correct certain morbid conditions of the system, by acting on the tonicity of the muscular fibre.*

TONICS.

These are medicines which impart vigor and tone to the system without materially increasing either the heat of the body or the frequency of the pulse.

Cullen thought that the tonic principle of remedies does not differ essentially from that which gives to them their bitter taste. That this opinion is without foundation, is at once evident from the fact, that some intensely bitter substances do not possess the least tonic virtue, whilst, on the other hand, some very valuable tonics are destitute of bitterness. Thus, opium and digitalis, though very bitter, have no tonic properties; and some of the metallic preparations are tonic, though devoid of bitterness.

The action of tonics, unless taken in very large doses, is not manifested by any immediate and obvious excitement. The vigor which they impart to the system is the result of a slow operation on the animal economy, and altogether different in its character from that temporary augmentation of force which is the immediate consequence of the operation of stimulants, properly so called.

When tonic remedies are employed in a debilitated state of the system, their operation is evinced by a gradual and permanent increase of the force of the circulation; an invigoration of the digestive powers, and of the general energies of the animal economy.

There are three ways in which these remedies may produce tonic effects on the system. 1. They may increase the strength of the system by improving digestion, and thereby giving rise to a more abundant and healthy formation of chyle. That debility

and disease may arise from an imperfect state of the chyle, there can be no doubt. Out of this fluid all the other fluid and solid parts of the system are ultimately formed; and, we may presume, that every material deviation from its healthy state must interfere with the regular operations of the animal economy. It is evident, therefore, that whatever has the power of restoring the digestive energies of the stomach, and thereby the healthy condition of the chyle, will, by this effect alone, give health and vigor to the body. 2. Tonics may also impart tone to the system by exciting a peculiar action in the part to which they are immediately applied, and thence propagating a similar action to the other parts of the body through the medium of the nervous system. The effects of impression on the stomach are often manifested in other parts of the body in an exceedingly violent and sudden manner. Debility, syncope, and even death, are sometimes suddenly produced by the action of indigestible food on a weak stomach. Seeing, therefore, such violent affections excited by articles that suddenly resist or prostrate the energies of the stomach, there is reason to believe, on the other hand, that whatever has a tendency to give vigor to this organ, will communicate a corresponding vigor to the general system.* 3. Finally, tonics may strengthen by being absorbed into the circulation, and by thus acting directly on the whole organization, through the medium of the blood. That remedial substances are carried into the circulation, is a fact which is, I trust, evident by what has already been said on this head in the first chapter; and there can be no reason why a tonic substance absorbed into the circulation, should not produce the same invigorating impressions on the parts with which it comes in contact, while circulating in the blood, as when applied to the surface of the stomach, the rectum, or skin. That they do in fact operate in this way, is further rendered probable by the new qualities which some of these substances impart to the urine and the other excretions.

The remedial effects of tonics are, however, not to be exclusively referred to any one of these modes of influencing the animal economy. They, no doubt, generally act, at once, in all these ways.

Although tonics do not produce any very evident excitement in the system, yet they have an obvious tendency to increase the inflammatory diathesis, and they are, therefore, as a general rule,

* Qui stomachum regem totius corporis esse
Contendunt, vera niti ratione videntur.
Hujus enim validus firmat tenor omnia membra:—
At contra ejusdem franguntur cuncta dolore.
Serenus Samonicus, De Med. Precept.

inadmissible whenever there is any tendency to inflammatory action in the system. It is, indeed, at once obvious, from the general effects of these remedies, that the diseases of debility alone are those in which they may be employed with advantage or propriety. As a general axiom, this undoubtedly holds good; yet experience has demonstrated that tonics may sometimes be used beneficially, in cases attended with an evident phlogistic condition of the system, as in the declining stage of gout and rheumatism.

As I shall have occasion to speak fully of the therapeutic application of tonics, when treating of the particular articles of this class, I will not pursue this subject any further, but proceed at once to the consideration of the individual tonics.

CINCHONA.—PERUVIAN BARK.

The cinchona is unquestionably the most important tonic we possess, and justly ranks among the most useful and indispensable articles of the materia medica.

Its introduction into regular practice is said to have occurred in the following manner:—In 1640, the lady of the Count of Cinchon, viceroy of Peru, was affected with a tertian intermittent, which resisted every mode of treatment that her physicians could advise. Being at length nearly exhausted by the disease, she was advised by the governor of Loxa, who had been made acquainted with the febrifuge virtues of this bark by an Indian, to use it as a remedy for her disease. She took it, and her complaint soon disappeared. The event of this case spread the reputation of the remedy rapidly throughout Spain, whence it was carried into Italy by the Jesuits, where it was gratuitously distributed among the poor sick at Rome, by Cardinal de Lugo, and his physician Sebastian Baldo. This latter person has the credit of having written the first work on this valuable remedy.* Its fame now rapidly extended itself through France, Germany, England, &c., and although much opposed on all sides, the value of its powers was finally established on the testimony of almost universal experience. It was not, however, till the year 1737, that the botanical character of the tree which affords this bark was ascertained. La Condamine, while traveling through the province of Loxa in that year, had an opportunity of examining the tree, a full description of which he published on his return to France, in the Memoirs of the French Academy. The name of *cinchona officinalis* was, soon afterwards, given to this tree, by

* Alibert.

Linnæus, in commemoration of the incident mentioned above. The powdered bark was also known by the name of Jesuits' powder, in consequence of its first having been brought into Europe, and extensively employed by the Jesuits.

The genus cinchona is a very extensive and remarkable family of trees of the natural order *Rubaceæ* and of the class Pentandria, order Monogynia, of Linnæus. They grow on mountains, and are never found in the plains. Until of late a great deal of confusion and uncertainty existed with regard to the natural history of this family of trees; and, indeed, there still exists no inconsiderable perplexity on the subject.

The different varieties of bark, as they occur in commerce, appear to be made up of a considerable number of distinct species, and are assorted into the *pale*, the *red*, and the *yellow*.

I. *The Pale Bark.*—The *pale* or gray bark of the shops is principally derived from the *cinchona condaminea* of Humboldt and Bonpland. This species of cinchona is found in abundance in the province of Loxa, and the neighborhood of Guancabamba and Ayavaca, in Peru. Bonpland asserts that this is by far the most valuable species of bark, and from its acknowledged superiority, the Spaniards have given it the name of *cascarilla fina*.

Besides this species, there are others which frequently go to make up the *pale* bark of commerce. Bonpland and Humboldt inform us that the *cinchona scrobiculata*, a species found very abundantly in the province of Jean de Bracemoras, forms a very great portion of the pale bark. The *cinchona nitida*, also, is occasionally mixed with *C. condaminea*.

In the United States, the pale barks are known under the general title of *Loxa bark*, and the finest specimens are sometimes called *crown bark of Loxa*. "The extension of the term Loxa bark to all the different varieties which belong to this class, is peculiar to the United States, and is not authorized by the facts of the case. They are not obtained exclusively from the province of Loxa, nor from the country bordering on it. The French and Germans distribute them into at least two distinct divisions, originally named from the place of growth or export, but depending at present upon peculiarity of properties, without any geographical reference. One of these divisions has the title of *Loxa bark;* the other is called *Lima bark*, by the French, and *Huanuco bark* by the Germans and Spaniards."

1. The genuine *Loxa bark* consists of very slender cylindrical pieces, from twelve to eighteen inches in length, varying in size from that of a small quill to that of the little finger. The bark is not above a line in thickness, with a grayish-colored epidermis, somewhat rough, and marked with transverse fissures. The internal surface is even or smooth, of an orange-yellow or reddish

hue, which becomes brighter on being moistened. The fracture is not fibrous or granular, but even and somewhat shining. "Two sub-varieties exist in this division—one with a light gray epidermis, called in French pharmacy *quinquina gris de Loxa;* the other brown, or dark gray externally, named *quinquina gris brusa de Loxa.*" The genuine or best *Loxa* bark is obtained from the C. condaminea.

2. *Lima Bark.*—The finest specimens of this variety of pale bark, do not differ materially in appearance from those of the Loxa. The ordinary and coarser kinds, however, are much thicker, the external surface is rough, with a great number of very *closely* arranged fissures, the epidermis being, generally, thick and spongy, separating readily in small laminæ, and leaving the surface marked with numerous circular depressions. It breaks with fracture, "which is compact and close on the exterior, but woody and fibrous on the interior. The internal surface is yellowish or reddish, and rougher or more ligneous than that of the Loxa bark." This variety of cinchona is thought to be derived from the C. lancifolia, the C. hirsuta, and from the C. purpurea. The epidermis of Lima bark is sometimes nearly white, "from the presence of chalky cryptogamous plants," and pieces occasionally occur, having a tawny ochreous appearance of the external surface. The former is called *Lima blanc* by the French, and the latter is the *Cascarilla ferruginea* of the Spaniards.

The pale bark appears to be much less extensively employed in this country at present, than formerly. It yields but little *quinia,* and is, therefore, rejected in the manufacture of the sulphate of quinia. It contains, however, *cinchonia* in large proportions, and as this principle is but very little, if in any degree inferior to quinia as a febrifuge, the *pale bark* is, doubtless, among the most valuable varieties of cinchona.

II. *Yellow bark.*—The officinal *yellow* bark, known in commerce under the name of *calisaya,* comes to us in pieces, of from three to four inches to a foot and a half in length, not so much rolled up as the preceding variety, and from a quarter of an inch to two or three inches in diameter. The epidermis is of a yellowish-brown color, somewhat variegated by gray-colored or white lichens, marked by transverse fissures, and easily separated from the subjacent cortical structure. In the larger kinds it is thick, rough, deeply indented by the transverse fissures, and composed of several layers, separated from each other by a reddish-brown membrane-like velvet." This epidermis possesses neither taste nor any of the active properties of the bark, and when pulverized, exhibits a dark red color. The texture of the bark is fibrous, and the fracture presents a number of shining points, which, when examined with a microscope, are found, when freed from the

salmon-colored powder that surrounds them, to be yellow and transparent. They readily separate when the bark is powdered, in the form of spiculæ, which, like those of cowhage, insinuate themselves into the skin, and produce a disagreeable itching and irritation. This variety of bark has a less astringent, but much more bitter and nauseous taste than the pale bark.

The *calisaya* sometimes occurs in flat, or nearly flat pieces, almost entirely divested of the epidermis, presenting, therefore, the yellow color of the bark, both on the external and internal surface. The bark of these flat pieces is usually much thicker, and of a more loose and fibrous texture than in the quilled variety. It is also less bitter, and less active in its medicinal properties than the rolled or quilled calisaya.

The yellow bark, or calisaya, contains a larger proportion of quinia than any other variety of cinchona, but it yields very little cinchonia.

The salts of quinia and lime are so abundant in this variety of bark, that the infusion of it instantly precipitates a solution of the sulphate of soda.

The particular species of cinchona which furnishes the calisaya or more valuable variety of yellow bark, is still a subject of doubt. It has, by many authors, been referred to the *C. cordifolia;* but the fact that no *calisaya* bark is brought "from those regions where the C. cordifolia most abounds," renders this opinion extremely problematical. It is much more probable that it is derived from a variety of the C. lancifolia; for Mutis, whose testimony on this subject is entitled to great respect, asserts "that it is positively derived from this species."

III. *Red Bark.*—Until recently, this variety of bark has been almost universally regarded as the product of the *C. magnifolia* of Ruiz, and *C. oblongifolia* of Mutis. The researches of Von Bergen, however, have rendered it manifest that this opinion is incorrect, and that nothing is, as yet, certainly known as to the particular species of cinchona from which the officinal red bark is derived. It is asserted by some that it is obtained from the same species which afford the pale barks, "but taken from larger branches, or from the trunk." La Condamine observes, that in the neighborhood of Loxa three kinds of bark are known, namely, a white, a yellow, and a red bark; all of which, he says, are the produce of trees growing together, and "not distinguishable by the eye."

The officinal red bark comes to us in pieces of various shapes and sizes. Some pieces are flat, others are partially rolled, and some are in quills or closely rolled cylinders. The rolled or quilled pieces vary in size, from about half an inch to two inches in diameter, and the flat pieces are generally large and thick, as

if obtained from the trunk of the tree. The epidermis is reddish-brown or gray, with fissures running in various directions, somewhat rough, and marked in many instances with a great number of small projecting points, "which correspond with small prominences on the exterior surface of the proper bark." The external cortical layer, immediately beneath the epidermis, is brittle, compact, and of a dark-red color, breaking with a smooth and resinous fracture. The internal surface is redder, of a fibrous woody texture, possessing more bitterness and astringency than the external part. This variety of bark possesses both quinia and cinchonia in considerable quantities, and is generally regarded as the most valuable of all the officinal varieties of cinchona. Mutis, however, observes, that its febrifuge powers are not equal to those of the yellow bark. It is very frequently found in an adulterated state, being either nothing but pale bark, colored with some other substance, or the red bark mixed with other powders resembling it in color.

Carthagena Barks. — The different varieties of cinchona brought from the Atlantic ports of Columbia are known in commerce under the name of *Carthagena bark.* All these barks have a white and micaceous epidermis; their taste "is less bitter, but more nauseous than that of the officinal varieties," and they contain but small portions of quinia and cinchonia. There are four varieties of Carthagena bark; the *yellow*, the *brown*, the *red*, and the *Santa Martha Bark.* The yellow variety is said to be the product of the *C. cordifolia*, and comes to us in irregular fragments, covered with a white and glossy epidermis. It is from one to three lines in thickness, of a spongy texture, breaking with a rough and splintery fracture. The brown Carthagena bark is also covered with a white and smooth epidermis, and wholly without fissures. It is of a hard compact texture, very heavy and thick, and of a dark-brown color internally. Its taste is bitter and astringent, and more nauseous than that of any of the officinal barks. The red Carthagena bark "is distinguished from the officinal red bark by its white shining, almost micaceous epidermis. It is sometimes compact and bitter, sometimes spongy, and with little taste." It is thought to be the product of the C. oblongifolia. It is seldom met with in this country. The Santa Martha bark has been but recently introduced to the notice of the profession. It is generally in small, irregular fragments, very slightly curved, from one to three lines in thickness, generally divested of its epidermis, "and presenting an appearance as if chipped from the large branches or trunk of the tree." Among these flat pieces there are usually others which are rolled or quilled, covered here and there with patches of a white or gray epidermis. This bark is "compact, of a pale-yellowish color, and a bitter and somewhat nauseous taste. It is usually considered superior to

the ordinary Carthagena bark." It is probably derived from the *C. macrocarpa*, the *C. ovalifolia* of Mutis, a species which, according to Humboldt, grows abundantly in the neighborhood of Santa Martha.*

Chemical character.—There is, perhaps, no article in the materia medica which has been so frequently subjected to chemical analysis as the different varieties of the officinal cinchona. It would be useless as well as uninteresting to give a detailed account of the various analyses that have been made of the bark. It will be sufficient to state the results of the most recent and authentic researches on this subject.

Various opinions have been expressed in relation to the particular principle in which the tonic or active properties of the bark are supposed to reside. Sequin thought he had demonstrated the existence of gelatine in cinchona, and he ascribed its febrifuge powers to this substance. In consequence of this supposed discovery, some of the French and Italian physicians employed glue in intermittents; and, according to the reports that have been published, with very considerable success. Mr. Westring, a Swedish physician of great eminence, was led to conclude, from his observations and experiments, that the febrifuge power of bark resided wholly in the tannin which it contains.

More recent chemical researches, however, have demonstrated the existence of peculiar alkaline principles in cinchona, in which its febrifuge or tonic properties appear exclusively to reside. We are indebted to Pelletier and Caventou for the discovery of this substance in cinchona, (Annales de Chimie, &c., t. xv, pp. 289, 337,) and its properties were subsequently more fully investigated by Bardollier, Henry, Pfaff, and Meissener (Schweigger's neues Jour. d'Chemie und Physik., B. 2, p. 413, B. 3, p. 62).

There are two kinds or varieties of this alkaline principle in cinchona. To the one the name of *cinchonia* is given; and the other is termed *chinium*, or *quinia*, or *quinine*. Both these substances are but sparingly soluble in water; alcohol and ether, however, dissolve them readily. They unite readily with acids, and form neutral salts, soluble in alcohol and ether, but not in water, unless supersaturated with the acid. In the natural state, as they exist in the bark, these alkaline principles are united with the *kinic acid*. They are very bitter, and their bitterness is considerably increased by their union with acids.

Cinchonia, when pure, consists of fine white, transparent, needle-shaped crystals. It dissolves with great difficulty in water, much more readily in ether, and still more speedily in alcohol. In consequence of its difficult solubility, it seems to possess but little bitterness when first tasted; when retained in

* See the Dispensatory of the United States of America, p. 220

the mouth, however, until a portion of it is dissolved in the saliva, or when its ethereal, alcoholic, or oleaginous solution is put upon the tongue, it tastes extremely bitter. It readily unites with, and neutralizes acids, forming with them saline compounds. "Of these salts of cinchonia, the sulphate, nitrate, muriate, phosphate, and acetate, may be dissolved in hot water and in alcohol. The tartrate, oxalate, and gallate are insoluble in cold water." Cinchona, according to an analysis made by Pelletier and Dumas, is composed of 76.97 parts of carbon, 9.02 of nitrogen, 6.22 of hydrogen, and 7.79 of oxygen. It does not suffer decomposition when exposed to the air, but it slowly absorbs carbonic acid, "and acquires the property of effervescing slightly with acids."

The *sulphate of cinchonia* is frequently employed as a febrifuge by the German and French physicians. It consists of a white and very bitter salt, "crystalizing in flexible, somewhat shining four-sided flattened prisms, terminated by an inclined face, and generally collected in fascicula." It dissolves in fifty-four parts of water, at a medium temperature, and in less than thirty parts of boiling water. By adding more acid, it is converted into a bisulphate, which is readily dissolved by less than half its weight of water at 58°. According to Pelletier and Caventou, this salt consists of one hundred parts of cinchonia, and 13.021 of sulphuric acid.

Quinia.—This valuable constituent principle of the officinal barks, may, by nice management, be obtained in the form of pearly, silky, needle-shaped crystals; but as it is usually prepared, and met with in the shops, it consists of a whitish and flocculent substance, resembling the oxide of zinc. It is much more bitter than cinchonia, and dissolves readily in alcohol and ether, but is almost insoluble in water. When subjected to heat, it fuses like the resins, and becomes brittle on cooling. It unites with acids and forms crystalizable salts. When exposed to the open air it undergoes no changes nor does it absorb carbonic acid. According to Pelletier and Dumas, *quinia* is composed of 75.02 parts of carbon, 10.43 of oxygen, 6.66 of hydrogen, and 8.45 of nitrogen.

The *sulphate of quinia* is justly regarded as the most valuable of all the cinchonine preparations. When properly prepared, it consists of white, silky, needle-shaped crystals, "interlaced among each other, or grouped in small star-like tufts. It possesses an intensely bitter taste; it dissolves very sparingly in cold water, requiring about seven hundred and forty parts at fifty-four degrees of Fahrenheit, for solution, while at the boiling point, it is dissolved in thirty parts." Its cold solution is opalescent; it is rapidly dissolved by pure alcohol, but only very slowly and sparingly in ether. By adding to it a small portion of sulphuric acid, it is immediately converted into a *super-sulphate*, the solubility of which in cold water is much greater than that of the simple

sulphate, without losing any portion of its medicinal properties. When exposed to a moderate degree of heat, the *sulphate* is deprived of its water of crystalization, and loses its crystaline form; when the heat is raised to two hundred and twelve degrees, it becomes phosphorescent, or luminous; and at a still higher temperature it undergoes fusion, acquiring the appearance of wax. According to Berzelius, the sulphate of quinia is composed of ten parts of sulphuric acid, 80.9 parts of quinia, and 9.1 of water. This salt is decomposed by alkalies and alkaline earths; and is precipitated from its solutions by potass, soda, ammonia, tartaric, oxalic and gallic acids; but these acids do not produce this effect when added in excess.

"The high price of sulphate of quinia has led to various attempts at adulteration. Sulphate of lime, sugar, mannite, starch, and stearin, are among the substances which have been fraudulently added. By attending to the degree of solubility of the sulphate in different menstrua, and to its chemical relations with other substances already mentioned, there can be little difficulty in detecting these adulterations. The presence of any mineral substances, not readily volatilizable, may be at once ascertained by exposing the salt to a red heat, which will completely destroy the sulphate of quinia, leaving the mineral behind."

According to researches of Pelletier and Caventou, the following are the constituent principles of the different kinds of officinal bark:

The *pale bark of Loxa* contains 1, a fatty matter; 2, a red coloring matter, being the cinchonic acid of Reuss; 3, a yellow coloring principle, readily dissolved by water and alcohol, and precipitated by the acetate of lead; 4, tannin; 5, gum; 6, starch; 7, lignin; 8, kinate of lime; 9, *kinate of cinchonia, and a very minute proportion of kinate of quinia.*

Yellow Calisaya bark contains "the fatty matter, the red coloring matter, the yellow coloring matter, tannin, starch, lignin, kinate of lime, and *acidulous* kinate of quinia, with a comparatively small proportion of kinate of cinchonia."

"*Red bark* contains the fatty matter, a large quantity of cinchonic red, the yellow coloring matter, tannin, starch, lignin, kinate of lime, and *a large proportion both of acidulous kinate of quinia, and of acidulous kinate of cinchonia.*"

"*Carthagena bark* contains the same ingredient with the red bark, but in different proportions. It yields, moreover, its alkaline matter with much greater difficulty to water."

From an accurate and extensive series of experiments by MM. Pelletier and Caventou, it appears that when cinchona is subjected for a considerable length of time to the action of boiling water, the cinchona in combination with the kinic acid is dissolved,

together with some gum, starch, yellow coloring matter, tannin, and a portion of red matter, kinate of lime, and generally a portion of fatty matter. By reason of the simultaneous existence of these various substances in the decoction, it soon loses, on becoming cool, its clear color, in consequence of a new compound, insoluble in cold water, formed by the combination which takes place between the tannin and the starch. A part of the red and fatty matter at the same time falls to the bottom, carrying with it a portion of the cinchonia, by which the active principle of the preparation is diminished. To obviate these circumstances in some degree, MM. Pelletier and Caventou recommend that a much larger quantity of water than usual be employed in making the decoction, in order to keep the whole of the cinchonia in solution; to filter it when cold, and afterwards to concentrate it by slow evaporation.

A better plan, according to Drs. Wood and Bache, (Dispensatory of the United States,) "is to add to the liquid some acid which may form with the quinia and cinchonia compounds more soluble than the native salts. Lemon juice has been long employed as a useful addition to the decoction of cinchonia, and we can now understand the manner in which it acts. Sulphuric acid in excess answers the same purpose. By acidulating the pint of water employed in preparing the decoction, with one fluidrachm of the diluted sulphuric acid, (elixir of vitriol,) we shall probably enable the menstruum to extract all the virtues of the bark."

Wine and alcohol extract very completely the active principles of cinchona. According to MM. Pelletier and Caventou, the alcoholic preparations contain the largest proportion of cinchonia, and constitute, therefore, the most powerful preparations of this remedy.

It is sometimes infused in lime-water, and by many this preparation is particularly recommended for children. In the American Pharmacopœia there is a formula for an infusion of cinchona, in which it is directed to triturate the bark with magnesia, previous to infusing it. When prepared in this way it is much stronger than when infused without the magnesia. This substance possesses the remarkable property of increasing to a very considerable degree, the solubility of resins, balsams, camphor, and oils, and as it appears that the active principle of cinchona resides chiefly in its resinoid part, it is upon this principle, no doubt, that the magnesia acts in increasing the strength of the aqueous infusion.

MM. Pelletier and Caventou have shown, that when an alkali or alkaline earth is added to an aqueous decoction or infusion of cinchona, the quinia and cinchonia are precipitated by the alkali; and the liquid, when filtered, is almost entirely inert. As cin-

chonia is, however, fully soluble in alcohol, there can be no objection, as these gentlemen observe, to the practice which has been recommended by some, of exhibiting the tincture of bark in combination with an alkali. "The gallic, oxalic, and tartaric acids, also, and the substances which contain them, form salts with the alkaline principles of the bark, which are but slightly soluble, and should, therefore, be excluded from the decoction."

It is a singular and important fact that tartar emetic, given in union with bark, loses almost entirely its emetic power. It appears that when these two articles are united, a partial decomposition takes place, the oxide of the antimony uniting with the tannin of the bark, while the cinchonine is set free.

The salts of iron, sulphate of zinc, nitrate of silver, oxymuriate of mercury, tartarized antimony, solutions of arsenic, and various vegetable infusions and decoctions, as those of galls, chamomile, columbo, cascarilla, horseradish, cloves, catechu, orange-peel, foxglove, senna, rhubarb, valerian, simaruba, and cornus florida, form precipitates with the solutions of bark. These substances do not, however, lessen the medicinal properties of the infusion, for they do not change, or in any way affect the active principles of the bark.

Therapeutic employment.—Mr. Alibert justly observes, that the history of cinchona is very intimately associated with that of intermittent fever, both from the circumstances which attended its introduction into regular practice, and the high character which it has long held and still sustains as a remedy in this disease. Of its very superior efficacy in intermittents, it would now, indeed, be altogether useless to adduce any evidence. Upon this subject the profession may be considered as unanimous. The only difference of opinion which yet prevails in relation to the employment of cinchona in these fevers, relates to the mode of administering it; the periods of the intermission at which it should be given; the proper doses; and the utility or inutility of a previous resort to evacuant remedies.

With regard to the propriety of evacuating the stomach and bowels, previous to administering the bark, considerable difference of opinion has been expressed by writers. Although some have expressed doubts as to the usefulness or necessity of employing purgatives and emetics preparatory to the use of the bark, yet general experience is decidedly in favor of the practice. Without doubt, many cases of intermittent fever may be effectually removed by bark without any previous evacuations. This is most apt to be the case in those instances which occur during spring or winter in subjects who have had the disease during the preceding autumn; and which may, therefore, be regarded as relapses of the former attacks. In intermittents occurring in summer and

autumn, in miasmatic districts, and where the biliary secretions are much affected, an emetic, followed by a dose of calomel and jalap, is in general a very useful measure previous to giving the bark. There is, too, sometimes a phlogistic tendency in the system which is unfavorable to the febrifuge operation of the bark, and in such cases cathartics will act beneficially, by reducing the general excitement of the system.

Bleeding, also, is an important preliminary in some cases of intermittents, before using the bark. I have had many examples of this kind in my own practice. The tendency to inflammatory action in the system is sometimes so great as to prevent the full development of the intermittent in its regular form; the intermission is incomplete, attended with restlessness, and an irritated state of the pulse; the cold stage is not marked by strong rigors, but only by creeping and protracted chills; and the hot stage does not terminate by a profuse and universal perspiration. In such cases the bark can seldom be employed with advantage, unless venesection and other evacuants be premised. By one efficient bleeding and cathartic, in instances of this kind, the fever will commonly assume its genuine character; the rigors will be strong; the perspiration which concludes the hot stage copious and general, and the intermission perfect. The bark will now act beneficially, however ineffectually it may have been employed previously.

Considerable diversitiy of opinion has been expressed in relation to the proper time for exhibiting bark in intermittents. Dr. Home gave it at the commencement of the hot stage. Heberden gave as much as four ounces immediately before the accession of the paroxysm; and Drs. Clark and Balfour, and others, recommended it to be given in the hot stage. The proper period for administering bark is, however, undoubtedly during the intermission. Upon this point the profession are now, I believe, unanimous.

Cinchona should always be given in as large doses as the stomach will bear. In general, from one to two drachms of the powder may be taken every hour. Some delicate stomachs will reject the bark when administered even in the smallest quantities. When this is the case it may be given in the form of decoction or infusion, or administered as a clyster. "With children who cannot be prevailed on to take the bark, we may administer it with much efficacy in this way, repeating the clyster every four hours." It has also been used effectually in children, by applying it externally, quilted in a shirt or waistcoat.

When the bark occasions purging, it must be given with the addition of small doses of opium. This is, indeed, frequently a very important addition to the cinchona. It not only prevents

the bark from acting on the bowels, but enables the stomach to bear much larger doses of it, and adds, moreover, in many instances, considerably to its good effects. The snakeroot may also sometimes be very usefully combined with the bark. Dr. Thomas says that this combination is particularly useful in intermittents of long continuance, affecting old debilitated persons, living in a damp situation, or when the season is rainy. I have myself occasionally given a combination of bark, opium, and snakeroot in cases of this kind, and the effects have, in general, been very favorable.

Bergius speaks very highly of a combination of bark and mustard in this disease. The late Professor Barton recommended a mixture of cinchona and black pepper as an exceedingly efficacious remedy in intermittents. The black pepper, indeed, appears to be a remedy of very considerable powers in this disease, if we are to credit the account given of its effects by Dr. L. Frank. This physician cured intermittents readily by giving his patients from five to eight grains of pepper twice a day. Dr. Chigini confirms this statement.*

At present, however, the *sulphate of quinia* is almost universally employed in preference to the bark, or any of its other preparations, for the cure of intermittents. The highly contracted state of the tonic powers of the cinchona furnished in this preparation, and the comparatively small portions which suffice to arrest the disease, render it altogether the most eligible preparation of the bark, not only in this, but in every other disease, where the cinchona is indicated. Given in doses of from one to two grains every hour during the intermission, it will do all that can be effected by the most liberal employment of the bark in substance.

Dr. Alibert, who has published a highly interesting work on *malignant intermittents*,† observes, that the bark is our only remedy when the disease assumes this character, and that he has known this inestimable remedy arrest, as if by magic, the delirium, convulsions, colliquative sweats, suffocating dyspnœa, lethargy, and excruciating pains in the head, which attend this variety of the disease. This writer also observes, that the epidemic constitution of the atmosphere occasionally impresses such a peculiar character on intermittent fevers, as to render them incapable of being cured by the bark.‡ Hillary speaks of an epidemic intermittent at Barbadoes, in which the bark was of no avail, unless combined with saline remedies, or some of the tonic bitters. M.

* Journal Complémentaire de Dictionnaire des Sciences Médicales.

† Traité sur les Fièvres Pernicieuses Intermittentes.

‡ Elémens de Thérapeutique, vol. i. p. 51.

Boulou, also, mentions an epidemic intermittent, in which the cinchona was found ineffectual.

When visceral obstructions accompany intermittents, the bark is a remedy of doubtful efficacy. This is more especially the case where the diathesis is considerably inflammatory. When the obstructions occur in weak and phlegmatic habits, I have, however, seldom found any very particular obstacles to the successful operation of the bark. In cases of this kind, a gentle mercurial impression will, in general, either remove the disease or render it more manageable by the bark. Dr. Barton observes that bark, combined with mercury in a small proportion, is one of the best medicines for removing the swelling of the spleen, which so often occurs after intermittent fevers.*

Remittents.—After the inflammatory excitement has been somewhat moderated by antiphlogistic measures, bark given during the remission has been recommended by some writers, as not only a safe, but a highly useful remedy. Judging from my own experience, however, I am decidedly of opinion, that the practice, is, in general, not a safe one, except it be resorted to in the decline of the disease, when the exacerbations are not marked by strong vascular action, and the remissions attended with a cool and moist skin, and a small compressible pulse. It has already been stated, that where the pulse remains irritated and tense, and other symptoms of an inflammatory tendency in the system be present, in *intermittents*, the cinchona will not only frequently fail to remove the disease, but aggravate its symptoms. This being the case we can hardly presume that the bark would be useful in remittents, in which there is always some febrile action present, however complete the remission may be. When the patient has been worn down by the long continuance of the disease, and proper evacuations have been premised, bark may, no doubt, be employed with considerable advantage in this form of fever.

In certain stages of *typhus fever*, bark is a remedy of considerable utility. During the stage of excitement, it is, however, wholly inadmissible. When the disease is somewhat advanced, and the powers of the system begin to sink, bark, in conjunction with stimulants, given in moderate quantities, will sometimes produce salutary effects. Where, in the latter stages of the complaint, the tongue and skin are dry, and delirium, or coma, with convulsive twitches attend, the bark is, however, by no means, a proper remedy. Here camphor is, perhaps, our most valuable remedy. It is in the state of convalescence, that the cinchona displays its salutary powers; but, in every other period

* MS. notes of Dr. B. S. Barton's Lectures on the Mat. Med.

of the disease, where the powers of the system require support, it is decidedly inferior to some of the more diffusible stimulants, such as wine, volatile alkali, opium, musk, &c.

It must be observed, that in all febrile affections, where symptoms indicative of inflammation of the mucous membrane of the alimentary canal are present, bark is always highly pernicious, however great the prostration may be. When in the latter stage of low fevers, the abdomen is tender to pressure; and the tongue red, or dry and brown, nothing can be more injurious than the employment of this tonic. No degree of prostration can justify the administration of bark under circumstances of this kind. In general, the Peruvian bark may be deemed an improper remedy, in all diseases where there is considerable irritation of the mucous membrane of the alimentary canal.

The bark has also been highly recommended, by some writers, in acute rheumatism and gout. In the former of these diseases, its powers have been particularly extolled by Morton, Fothergill, Saunders, and Haygarth. This latter writer states, that for many years he gave it in this disease in doses of from grs. v to xv every two, three, or four hours, having previously evacuated the stomach and bowels by means of antimony; and if this quantity proved beneficial, he gradually augmented the dose to grs. xx, xxx, xl, taking particular care never to increase the dose beyond what agreed with the patient. He observes, that under this treatment, in the great majority of cases, "the pains, swellings, sweats, and other symptoms of inflammatory fever, manifestly and speedily cease, till health is perfectly restored."

Of the propriety of this practice, however, there is reason to entertain much doubt. From my own experience I can say nothing either for or against it, having never employed it in this disease; but from the known properties of the bark, we may infer, *à priori*, that it is a medicine which can be seldom employed in the acute form of rheumatism, whilst the inflammatory fever continues, without doing injury. After the sympathetic fever has been reduced by proper evacuants, and other antiphlogistic measures, the bark may, no doubt, be resorted to with advantage. Dr. Scudamore observes, that when the convalescence begins—when the tongue is becoming clean, the urine assuming a light specific gravity, the bowels acting regularly, and the skin relaxed and soft to the feel, he has found the bark administered either as Dr. Haygarth directs, or in decoction with its tincture and sulphuric acid, a valuable medicine. Under opposite circumstances, however, he considers its employment of very doubtful efficacy.*

Acute rheumatism, occurring in autumn, or in miasmatic dis-

* Scudamore on Gout and Rheumatism, p. 302.

tricts, sometimes assumes a remittent, and even an intermittent type, the biliary organs being prominently disordered. In cases of this kind, the bark may be employed with much advantage, after the alimentary canal has been well evacuated by emetics and mercurial purges.

Dr. Tavares,* a Portuguese physician, speaks very highly of the remedial powers of bark in gout. He says, in the words of Dr. Held, whom he quotes in favor of this remedy: "Uno verbo, cortex peruvianus in podagra *divinum* est *remedium*." It is also recommended by Drs. Small and Saunders as decidedly useful when administered in large doses during the intermissions of pain and fever, after the local inflammation has been abated.† It does not appear, however, that this practice has ever been much pursued, and very few, I presume, would now be willing to adopt it. In the irregular form of this disease, where great debility attends, bark may be employed with advantage; but in the majority of cases of regular gout it cannot be resorted to with safety. The late Dr. Barton used to state in his lectures, that he had observed the bark to be particularly pernicious in gout, when it evinced a tendency to shift its situation to the stomach, lungs, or brain.

According to some British writers, the bark is a remedy of very considerable efficacy in erysipelas. Fordyce gave it in drachm doses every hour, and, as he informs us, with the most decided advantage. Sir G. Blane, also, in his Medical Logic, observes, "bark is the best remedy in erysipelas," and he adds, that his success with it has equaled Dr. Fordyce's. Instances of the successful employment of the bark in this disease are also related by Dr. Parkman.‡ When the attending fever is of a typhoid character, and the local affection manifests a tendency to gangrene; or in the erysipelas of old and debilitated habits, the bark is, indeed, a highly useful remedy. In several instances that occurred to me during the last few years, I derived great advantage from the free employment of the sulphate of quinia after proper evacuations. This tonic will, also, frequently prove very beneficial, when, after the local inflammation has nearly subsided, the patient is left in a state of considerable debility. In the ordinary cases of erysipelas, however, where the system is plethoric, or the febrile excitement active, the employment of bark is decidedly contra-indicated, and can seldom fail to do mischief when given in the active period of the disease. In a late work there is a form of erysipelas described under the name of *erysipelas phlegmo-*

* Observationes et Epicrisis de Corticis Peruviani salutari et proficus usu in Podagra. See Scudamore on Gout, p. 121. Philada. edition.

† Scudamore.

‡ New England Journal of Med., vol. xii. p. 132.

nodes, which is said to be very prevalent in the British navy, and in which bark with mineral acids may be given with much benefit, when it occurs in persons advanced in life, or of a weak habit, and assumes a typhoid character.*

In *scarlatina anginosa*, the bark has been much recommended by some writers. In the last stage of this complaint, where there is great prostration of strength, with symptoms of malignancy and putrescency, and a tendency to gangrene in the throat, the bark is undoubtedly a medicine calculated to do good. In the simple form of scarlatina, however, the bark is inadmissible, except, perhaps, as a tonic during the state of convalescence; and even here it will seldom be necessary or very useful. Nor can this tonic be employed in the malignant variety of the disease during the inflammatory stage, without the risk of doing a great deal of injury. Formerly it was customary to prescribe the bark in the early stage of this variety of the disease, but the experience of the profession is now universally opposed to this practice. Bleeding, purging, emetics, cold and warm effusions, are the remedies to be relied on during the stage of excitement, in both the simple and malignant forms of the disease.

Not much can be said in favor of bark in the cure of epilepsy and tetanus. In the former of these complaints it was once a good deal prescribed, but it does not appear to be entitled to any particular attention for its powers in this way. In tetanus it was employed by Dr. Rush, and he speaks favorably of its effects. Dr. Morrison, in his excellent work on tetanus, observes, what indeed will be readily assented to, that the disease being conquered, the patient should take wine and bark for many weeks. I have, however, never heard of any case in which the bark effected a cure; in the cases in which it appeared to do good, it was given in conjunction with the free use of wine, to which latter we may, I think, fairly attribute the benefit which may have been derived from such a combination.

Of the use of bark in chorea, Dr. Cullen entertained a very favorable opinion. I have seen one case effectually cured by the bark, together with a few purges. The patient was a very delicate girl, about twelve years old, very debilitated before the disease came on, and of a strumous habit. She took the bark in forty grain doses, four times a day, having previously evacuated the contents of the bowels by purgatives, and was cured in about three weeks. In general, however, I should not be inclined to use the bark in this disease, except in the state of convalescence, at which time it may be serviceable. I am fully satisfied, from what I have seen, that the purgative plan of treatment recom-

* Surgical Observations, by Mr. Copeland Hutchinson.

mended by Hamilton, with the occasional employment of gentle tonics, or antispasmodics, will, in the majority of cases, be more effectual than any other plan of treatment with which we are at present acquainted.

Pertussis is another of the spasmodic diseases in which the Peruvian bark has been particularly recommended. Dr. Morris appears to have been the first who employed the bark in this disease, and his report of its effects is very favorable. He gave it with castor.* Cullen observes, that in the advancement of the disease, when the cough is kept up by habit, and no pulmonary congestions are present, the bark may put an end to the disease. Many of the German writers speak particularly in favor of the bark in this disease. In this country it is, I believe, very seldom, if ever, given; and except under the circumstances mentioned by Cullen, it does not, I am inclined to believe, deserve much attention.

Bark has also been much prescribed in asthma. In the paroxysm it can be of no service; but, where the disease is connected with a cachectic state of the system, attended with indigestion, this, in common with other tonics, may be employed with advantage.

In *pulmonary consumption* the bark has been recommended by some writers as a useful remedy. Observing that this disease is marked by periodical paroxysms, with pretty regular cold fits, followed with heat, and at last, copious sweats, succeeded by a temporary abatement of all the symptoms, physicians were led to suppose, that as the bark is so valuable a remedy in intermittents, which are characterized by a similar train of symptoms, it might be employed with advantage in phthisis. Experience, however, has proved that it is not only of no value in this disease, but uniformly pernicious in its operation. "I have seen the bark given," says Dr. Fothergill, "in almost every state of phthisis pulmonalis, even in the commencement, whilst the breast was in pain, the cough dry and harsh, the pulse quick and hard, and the heat considerable. What was the consequence? Frequently an hemoptysis, and all its worst attendants—ulcerated lungs, purulent spitting, colliquation and death."†

This writer states, that symptoms resembling those of genuine phthisis, are sometimes produced by delicate mothers suckling their children longer than is consistent with their ability. In cases of this kind he observes, the bark given early and in moderate doses, often produces very excellent effects; and adds that he is satisfied, that by this remedy, he has "retrieved many from de-

* Medical Observations and Inquiries, vol. iii. p. 281.

† London Medical Observations and Inquiries, vol. v. p. 347.

plorable situations," and that, under such circumstances, a prudent employment of the remedy may be made with safety and advantage.

Where symptoms of consumption supervene, in consequence of copious discharges from abscesses, fluor albus, or other similar debilitating evacuations, the bark is a useful remedy, provided the lungs be not yet inflamed. If, however, the breathing is oppressed, the cough dry, the pulse quick and hard, with shooting pains through the chest, the bark will inevitably increase the disease.*

There is another variety of consumption, in which the bark may sometimes be beneficially employed. It is that species of the disease which has been lately described under the name of *dyspeptic phthisis.* In the early stages of this complaint, whilst the affection of the lungs is as yet sympathetic, the moderate employment of bark, with laxatives, may be attended with very beneficial results. It is, however, decidedly pernicious whenever the pulmonary organs become the seat of inflammation or organic alterations.

In *catarrhal phthisis,* or, as it is more properly called, *chronic bronchitis,* where the expectoration is copious, and the system much debilitated, much benefit may sometimes be derived from the free use of this tonic. I have prescribed the sulphate of quinia, in conjunction with balsam copaiva, with advantage in a few instances of this affection. Dr. Hastings states, that when given in union with the diluted sulphuric acid, the Peruvian bark tends to restrain the profuse night sweats, and to improve the secretion from the mucous membrane of the lungs. I have used quinia, in union with the extract of conium, with decided benefit in chronic bronchitis succeeding hooping-cough.

Of the use of bark in *dyspepsia,* I have no very favorable opinion, when the disease is once completely formed, and the lungs or liver brought into a morbid condition. In mere weakness of the stomach, giving rise to flatulence and acidity, the bark, either by itself or in combination with iron, may be used with advantage; but in that fixed form of the disease, in which the mind and body are equally unfitted both for the enjoyments and duties of life, the bark, and, indeed, all tonics, must be administered with great circumspection.

In *scrofulous complaints* the bark is a remedy of very considerable powers, and deserves to be placed among our most useful medicines in this disease. "In tumefied glands, where the habit happens to be feeble, and the circulation weak, from constitution or accident, bark is a most efficacious remedy; and, what

* Dr. Fothergill.

is remarkable, acts as a resolvent and discutient."* Dr. Fordyce observes, also, that much may be done with this remedy in scrofulous ulcerations, or in "gleety, phagedenic, and semi-gangrenous sores." In debilitated persons of a strumous habit, the bark, with cold bathing and iron, is a very valuable remedy. Bark, in combination with the mineral alkali, has been known to remove scrofulous swellings, when no other form of this medicine would have the least effect.† In a few cases of ulcerations, I obtained much advantage from the bark given conjointly with cicuta and minute portions of corrosive sublimate. In this stage of the complaint, however, we can very seldom procure complete relief by any mode of treatment which has hitherto been devised. In scrofulous, or exanthematous *ophthalmia*, the *sulphate of quinia* is a most excellent remedy. Dr. Mackenzie, of Glasgow, asserts, that in the majority of instances of this affection, in which he employed this remedy, its beneficial effects "were very remarkable." In most of the little patients "to whom the quinine was given, it acted like a charm." Sir A. Cooper, also, speaks in the most favorable terms of the effects of this remedy in scrofulous inflammation of the eyes. My own experience enables me to bear testimony to the great usefulness of this tonic in this form of ophthalmia. I have prescribed it in nine or ten cases, and in every instance with unequivocal advantage. Before having recourse to this remedy, the disordered state of the alimentary canal should be corrected by mercurial purgatives, and a mild and digestible diet.

The bark has also been recommended as very serviceable in certain varieties of *dropsy*. Where, for instance, anasarcous swellings depend on mere debility, and no visceral obstructions exist, the bark, as a general roborant, is a remedy of excellent powers. In combination with cream of tartar, it is said to be peculiarly efficacious in the dropsies which succeed intermittents. I should doubt, however, its general applicability in cases of this kind, since dropsies from this cause are very commonly connected with visceral indurations; a circumstance which experience shows to be especially unfavorable to the salutary operation of this remedy.

In *hemicrania*, when, like an intermittent, it returns at regular periods, the bark is the best remedy with which we are acquainted. I have usually combined it with valerian, and administered it in large doses. It is always useful to evacuate the stomach

* An Account of some Virtues of the Peruvian Bark, not generally known nor described, particularly in Scrofulous Cases, by John Fordyce, in Med. Observ. and Inquir., vol. i.

† MS. Lectures of the late Professor Barton.

and bowels previously to employing this remedy. In *periodical* neuralgia, we possess no remedy equal in efficacy to the bark or quinia. Given in *large* doses, it often arrests the disease in a short time. In all painful affections of a periodical character, the quinia is a highly efficacious remedy.

The Peruvian bark is also very commonly prescribed in gangrene. When the gangrene depends on deficiency of action, this remedy is of unquestionable utility. Where it depends on increased action or inflammation, the bark is always injurious if it be given before the general inflammatory excitement has subsided. To promote the separation and sloughing of dead parts, however, and support the sinking powers of the system during this process, after the general inflammatory action has disappeared, the bark may be very advantageously resorted to. It is usually given in combination with opium, volatile alkali, or wine, and its powers are much assisted by these articles. In *cancrum oris*, or the sloughing ulceration of the gums and cheeks of children, the quinine is, perhaps, the most effectual internal remedy we possess. I have derived the greatest benefit from the free use of this tonic in several instances of this kind.

Having now given an account of the therapeutic application of the bark, it remains for me to say something concerning its preparation and modes of exhibition.

With the exception of the sulphate of quinine, the best form for exhibiting the bark, undoubtedly, is in substance. The stomach, however, will sometimes reject it when taken in this way, and in this case it should be given in the form of an infusion, conjointly with the tincture. When thus administered, it will, in general, remain very easy on the stomach. By giving the infusion and tincture together, we obtain all the power of the bark residing both in its gummy and resinous principles—an advantage which cannot be so completely had by using these preparations separately.

If the bark disagrees with the stomach in whatever shape it be taken, it may be beneficially employed in the form of a clyster. Administered in this way it is particularly applicable to the diseases of children, where it may be necessary to employ this remedy. The bark may also be advantageously used as an external application, either in the form of powder quilted into a waistcoat, or of decoction, as a bath. Dr. Alexander states, that he cured intermittents by immersing the lower extremities in a decoction of bark, when the stomach rejected the medicine.

The *sulphate of quinia* is, without doubt, the most valuable preparation of the cinchona we possess; and it has now in a great degree superseded the employment of the bark in periodical affections. Experience has, indeed, fully established its excellent

powers, as a remedy in intermitting fevers and other analogous *periodical* affections usually treated by tonics. As a general tonic, it does not, however, appear to be equal to the bark in substance. In general debility and relaxation of the system, in extensive suppurations, in gangrene, &c., the sulphate of quinia seldom procures the advantage that may be obtained from the cinchona itself. Occasionally, this preparation acts strongly upon the alimentary canal, producing violent purging or vomiting. When it causes purging, the best corrective is the addition of a small portion of the sulphate of zinc—a combination which is peculiarly beneficial in intermittent fevers. In general, its stimulant powers are much more active than those of the cinchona in substance. A full dose is usually followed by a manifest increase of the temperature of the surface, and a feeling of tension and fullness in the head. Its tendency to determine the blood to the brain is, indeed, very considerable. When full and frequent doses are taken, the countenance generally becomes flushed, and the vessels of the head turgid, attended with a sense of confusion, heaviness of the head, and often ringing in the ears. In three instances under my own observation, the cerebral congestion produced by this article was so violent as to give rise to a singular form of delirium, resembling the mental derangement which is excited by an over-dose of stramonium.

It is prepared in the following manner:—Boil, for half an hour, two pounds of the appropriate bark in powder, in sixteen of distilled water, acidulated with two fluidounces of sulphuric acid—strain the decoction through a linen cloth, and submit the residue to a second ebullition, in a similar quantity of acidulated water: mix the decoctions, and add, by small portions at a time, powdered lime, constantly stirring it to facilitate its action on the acid decoction. (Half a pound is near the quantity requisite.) When the decoction has become slightly alkaline, it assumes a dark-brown color, depositing a reddish-brown flocculent precipitate, which is to be separated by passing it through a linen cloth. The precipitate is to be washed with a little cold distilled water, and dried: when dry, it is to be digested in rectified spirit, with a moderate heat, for some hours: the liquid is then to be decanted, and fresh portions of spirit added, until it no longer acquires a bitter taste. Unite the spirituous tinctures, and distil in a water bath till three-quarters of the spirit employed be distilled over. After this operation, there remains in the vessel a brown viscid substance, covered with a bitter, very alkaline and milky fluid. The two products are to be separated and treated as follows: to the alkaline liquid, add a sufficient quantity of sulphuric acid to saturate it; reduce it, by evaporation, to half the quantity; add a small portion of charcoal, and, after some minutes' ebullition,

filter it while hot, and crystals of *sulphate of quinia* will form. These are to be dried in bibulous paper. Two pounds of the bark will yield about five to six drachms, of which eight grains are considered equal to an ounce of bark. This is the younger Henry's process, modified by Paris. The dose of this preparation varies from one to five grains; but the usual dose, when a frequent repetition is required, as in intermittents, is from one to three grains. For the mode of prescribing it see formulæ.

The *acidulous phosphate of quinia* has recently been strongly recommended by Professor Harleso. He asserts that it is, generally, much more easily supported by irritable stomachs, than the sulphate; and that it is preferable, moreover, in subjects of a nervous temperament, and in those who are liable to sanguineous congestion or inflammations. "It never produces that kind of uneasiness which we sometimes observe to follow the administration of the sulphate, and it has, besides, the advantage of exciting the heart less powerfully, and of occasioning no irritation of the respiratory organs." It is but slightly soluble in water and alcohol, and is best given in the form of a pill or powder. The dose is from one to four grains.*

The *extract of cinchona* was formerly a good deal employed, particularly in the diseases of children, requiring tonic remedies. From the experiments of Pelletier and Caventou, however, it appears that this preparation possesses but feeble tonic powers. The extract made by maceration in cold water is more active than that prepared by decoction or infusion. The alcoholic extract possesses considerable powers: but it is, nevertheless, much inferior to the sulphate of quinine, or the bark in substance.

The *alkaline principles of the cinchona*, in their simple state, that is, without being combined with an acid, have also been employed in practice; and it would appear that their powers are but little inferior to those of the sulphate of quinine. Nieuwenhius employed both the cinchona and the quinia. The former appears to be less efficacious than the latter, and is, moreover, apt to disagree with the stomach, and to excite vomiting. Elliotson also employed the quinia in its simple state, and his experience led him to consider it fully equal to the sulphate. He prescribes it in doses of five grains every six hours in intermittent fevers, with entire success. As the simple quinia is much more easily prepared, and at much less expense than the sulphate, it would appear to be well entitled to the attention of the practitioner.

The *tincture of cinchona* made with diluted alcohol, contains much of the active properties of this article. In affections or

* Heidelberg Klinische Aunal, vol. v. p. 535. Archives Générales. Aug. 1830.

states of the system, where tonic and stimulating remedies are indicated, as in the low states of typhus fever, this tincture constitutes an excellent remedy. It is, however, much too stimulating to render it a proper medicine in intermittents, and other affections where the liberal use of the bark may be required. In mere gastric debility, with a relaxed and torpid state of the general system, the *compound tincture of bark* (Huxham's tincture) is often a very useful medicine. In the convalescence of fevers, where the general languor and debility are considerable, an excellent mode of administering the bark is to give the watery infusion and tincture in combination. A wineglassful of the infusion, with a teaspoonful of the tincture, may be given at a dose, and repeated according to the degree of debility and relaxation. In this way all the powers of the bark are obtained, and in a form which generally agrees much better with the stomach than either the cinchona in substance, or sulphate of quinine.

When employed in the form of *infusion*, or decoction, a small portion of sulphuric acid should be added, which, combining with the active principles of the bark, renders them much more soluble, and thereby greatly increases the strength of the infusion. About a drachm of the diluted sulphuric acid, or elixir of vitriol will suffice for a pint of infusion or decoction.

Formulæ.

℞.—Pulv. cinchonæ flav. ℥i;
Elix. vitriol. ℥i;
Aq. bullientis ℥xvi. Simmer it slowly down to ℥xii. Strain, and give a wineglassful every hour or two.

℞.—Sulphat. quiniæ gr. xii;
Sulphat. zinci gr. iv;
G. aloes gr. iii;
Conserv. rosar. q. s.—M. Divide into ten pills.

℞.—Sulphat. quiniæ gr. xii;
Sulph. acid gtt. iii;
Syrup. limonis ℥i.—M. Dose, a teaspoonful.

℞.—Sulphat. quiniæ gr. xii;
Sulph. acid. gtt. iii;
Extract glycyrrh. ℥iii;
Aq. menthæ ℥iv;
Aq. fontanæ ℥iv.—M. Dose, a tablespoonful.

℞.—Pulv. cinchon. flav. ℥i;
Pulv. serpentariæ ℥ii;
Sodæ subcarbonat. ℥iss.—M. Divide into eight equal parts. Dose, one every two hours.

℞.—Sulphat. quiniæ ℈i;
Sulphat. ferri gr. x;
Extract. hyoscyam. ʒss.—M. Divide into twenty pills. An excellent combination, in chlorosis and a leucophlegmatic state of the system, when free from febrile irritation.

ARISTOLOCHIA SERPENTARIA.—VIRGINIA SNAKEROOT.

This plant is found exclusively in the United States, and constitutes an excellent article of our indigenous materia medica. The root, which is the only part employed in medicine, is perennial, consisting of very numerous fibres matted together proceeding from a common head or caudex. The fibres are of a yellow ochre color externally, and of a pale yellow within. The central or knotty part of the root is of a dark brown color. It has an agreeable aromatic smell, resembling that of valerian; its taste is warm, pungent, and bitterish, not unlike that of camphor or of the pinus canadensis. Subjected to the action of alcohol, "it affords a bright green tincture, which is rendered turbid by water; by filtration a small portion of a green matter is separated, but its transparency is not restored. It neither precipitates tannin nor gelatine, nor affects the salts of iron or tincture of turnsole. When the diluted tincture is distilled, the spirits and tincture pass over milky, strongly impregnated with its peculiar odor." Lewis states that the spirituous extract is more powerful than the watery, "not so much from its having lost less in evaporation, as from its containing the active parts of the root concentrated into a smaller volume; its quantity amounting only to about one-half of that of the other." According to Chevalier's analysis, the root of this plant contains a volatile oil, a yellow, bitter principle, soluble in water and alcohol, resin, gum, starch, albumen, lignin, and various salts. Bucholtz obtained from 1000 parts 5 of a green, fragrant, volatile oil; 28·5 of a yellowish-green resin; 17 of extractive matter; 181 of gummy extract; 624 of lignin, and 144·5 of water. Chevalier considers the yellow, bitter principle as analogous to the extract of quassia called *quassin* by Dr. Thompson.

The snakeroot was first brought into notice as a remedy for the bite of venomous serpents; and although soon found to be destitute of antidotal powers, experience showed it to be a remedy of very considerable value in a variety of circumstances.

When taken into the stomach it increases the force and frequency of the pulse, excites a glow of heat throughout the system, and produces diaphoresis. It is not, however, simply stimulant and diaphoretic in its effects, for along with these qualities it

possesses very important *tonic* powers. In excessive doses it often occasions nausea, severe tormina in the bowels, and occasionally dysenteric symptoms, particularly tenesmus.

Possessing, along with its tonic, pretty powerful stimulant properties, the snakeroot is peculiarly suited to fevers of a low grade of excitement; for the same reason, however, it can never be employed without much risk of injury wherever blood-letting is indicated.

In every variety of fever, however, when the system is sinking into a typhoid state, the snakeroot is a remedy of unquestionable utility. It is especially applicable in the latter stages of febrile diseases, when the skin and tongue remain dry and hot, and the pulse is feeble and frequent. When given in this state it often excites a general diaphoresis; the tongue becomes moist, and the pulse and general powers of the system are invigorated.

A good deal has been said in favor of the powers of the serpentaria in putrid fevers, and from the general properties of this remedy, there can be little doubt of its applicability to the treatment of fevers of this kind.

The snakeroot was formerly much employed in intermittents. Of its efficacy, however, in this disease, when administered by itself, not a great deal can be said. I have employed it in some instances, but almost always without success, and I am inclined to believe that it is not often capable of arresting the disease. When united, however, with bark or some of the bitter tonics, it seems to increase their efficacy, and it is in this way that it is now commonly employed in intermittent and remittent fevers. It is particularly useful with Peruvian bark, in those intermittents where the system is depressed and sluggish during the intermission, with a small and feeble pulse, and a cold and dry state of the surface of the body.

During the prevalence of the epidemic pneumonia typhoides, in this country, the serpentaria was much prescribed by some physicians. Being at once stimulant, diaphoretic, and roborant, it was peculiarly calculated to produce beneficial effects in this disease, by equalizing the circulation, and imparting vigor to the vital powers. Dr. Dyckman states, that he has prescribed the snakeroot in combination with seneka, with marked advantage in this disease. It may also be employed with advantage in the latter stages of pneumonia and bronchial affections, attended with much prostration.

The infusion of this root forms an excellent gargle, in ill-conditioned ulcers of the throat.

The dose, in powder, is from twenty to thirty grains. It is usually given in infusion, of which a wineglassful may be taken

every half hour or hour. By boiling, its powers are almost entirely destroyed.

Formulæ.

℞.—Rad. serpentariæ ℥i;
Rad. columb. ʒii;
Cort. cinnamon. ʒi;
Aq. bullientis ℥vi.—M. Macerate for one hour. Dose, a wine-glassful.

℞.—Pulv. serpentariæ,
Magnes. albi, āā gr. xvi;
Pulv. rhæi gr. xii.—M. Divide into six equal parts. This is a very useful mixture in dyspeptic affections of infants.

GALIPEA OFFICINALIS, (CUSPARIA FEBRIFUGA.) ANGUSTURA BARK.

It is not a great while since this bark has been known to the profession; but it would appear from the experience of those who have given an account of its remedial powers, to be entitled to very considerable attention. The Angustura bark is obtained from a small forest tree, growing in abundance in the woods near Carouy and Alta Gracia. It is also found in the valley of Santa Fe, between Cumana and New Barcelona,* and particularly in the woods near Carouy and Alta Gracia. The botanical character of this tree was not known until it was described by Humboldt and Bonpland. Wildenow, to whom specimens were sent by these enterprising and intelligent travelers, constituted it into a new genus, to which he gave the name Bonplandia. De Candolle, however, found that the generic character of this tree, as described by Humboldt and Bonpland, coincided fully with the genus *Gallipea* of Aublet. Dr. Hancock afterwards ascertained that the tree described by Humboldt, is not that from which the officinal Angustura bark is obtained, "but probably another species of the same genus, which these authors had mistaken for it, having been led into error by the imperfect specimens which they received." Hancock proposed the name of *Gallipea officinalis* for this tree, which title is adopted in the Pharmacopœia of the United States.

The bark of this tree comes to us in small, slightly convex, wrinkled, and externally whitish pieces, of about four or five inches in length. It has a very bitter and slightly aromatic taste. Its odor is peculiar and nauseous. When pulverized it becomes of a pale yellow color.

* Alibert.

According to M. Vauquelin, this bark does not precipitate animal gelatin, but it forms a copious precipitate with tartar emetic, iron, copper, lead, tin, bichloride of mercury, pure potassa, nitric and sulphuric acids, and by infusions of galls and yellow cinchona. One of its principal chemical peculiarities, therefore, is, that it does not precipitate animal gelatin. M. Vauquelin thinks, too, that the principle which gives to this bark the power of precipitating metallic solutions, is not the same as that which gives a similar property to the Peruvian bark.* It appears that the Angustura bark contains resin, extractive, carbonate of ammonia, and an essential oil. Its active principle is readily extracted by cold and hot water, and it does not appear that long boiling injures its powers.† Alcohol extracts its bitterness, but produces a precipitate with the watery infusion.

The Angustura bark is a stimulant tonic of very considerable powers; and is much less apt to nauseate or oppress the stomach than the cinchona bark. It is, especially, a useful tonic in cases of general muscular debility and relaxation, attended with an irritable state of the system. When first introduced into notice, it was highly extolled as a remedy in intermittent fevers; and although it has now lost much of its former reputation, there are still some highly respectable physicians who regard it as a remedy of very great power in the cure of intermittents. In intermittents attended with much weakness of the digestive functions, and general debility and relaxation, the Angustura bark is a peculiarly valuable remedy.—(Richter.) It may be very advantageously given in union with the cinchona; and Vogel asserts, that he has often succeeded in arresting the disease with this combination, after the bark given by itself had failed to do good.

It has also been recommended as particularly useful in chlorosis. I have lately prescribed it in a case of this complaint, in combination with iron, and the effect was very beneficial. In this case, however, the iron may have been the most efficacious of the two articles in combination.

In dyspepsia, while the disease is yet entirely confined to the digestive organs, the Angustura bark may be beneficially given. I have used it in my own case, and obtained considerable relief from it. It is also said to be a very effectual remedy in diarrhœa, depending on a weakness of the bowels. In chronic and malignant dysentery, the Angustura bark is said to be a very useful remedy. Dreyssig asserts that he has used it with great advantage in what he calls the putrid form of this disease; and Richter, also, speaks very favorably of its powers in diarrhœa and dysen-

* Alibert, Mat. Med., tom. i. p. 78.

† Paris's Pharmacologia.

tery. In these affections I have never administered it, but I can readily believe, that in the former disease, and in the chronic form of the latter, it may be employed with advantage.

In powder, it is given in the dose of from six to thirty grains. The dose of the decoction or infusion is from ʒi to ʒii. When given in very large doses it has a tendency to produce nausea. The incompatible substances are: sulphate of iron, sulphate of copper, oxymuriate of mercury, nitrate of silver, tartarized antimony, subacetate and acetate of lead, potass.

False Angustura Bark.—The French writers on the Materia Medica describe a bark, under this title, which in Europe has, of late years, been frequently found mixed with the true Angustura, and which is said to possess very poisonous properties. It is much thicker, heavier, harder, and more compact than the genuine bark; it has a dull and blackish fracture; the epidermis is of a ferruginous, and the internal surface of a brownish color; it yields, on being pulverized, a white, slightly yellow powder. It is entirely destitute of odor, but possesses intense bitterness. It does not become tenacious and soft by maceration in water, as does the genuine Angustura. According to Pelletier and Caventou, it contains a peculiar alkaline principle, to which they gave the name of *brucia*, and upon which its deleterious properties depend. "In consequence of the presence of this principle, a drop of nitric acid upon the internal surface of the bark produces a deep red spot," and when the acid is applied to the external surface, its color is speedily changed to a fine emerald green. This bark is now generally referred to an unknown species of the genus strychnos.

Formulæ.

℞.—Cort. angusturæ,
Flor. arnic., āā ʒii;
Aq. fervid. ʒiv. Boil down to three ounces; strain, and add, Acet. vini,
Syrup. aurant., āā ʒi;
G. Arab. ʒi;
Tinct. opii gtt. lx.—M. S. Dose, a tablespoonful every hour. This is highly praised as a remedy in typhoid dysentery. (*Richter.*)

℞.—Pulv. cort. angust.,
Pulv. cinchon. flav., āā ʒss.—M. Divide into six equal parts. Dose, one every three or four hours.

COLUMBA.

This is the root of the *cocculus palmatus*, a native of Mozambique, on the southeastern coast of Africa. Until a comparatively recent period, this plant was entirely unknown to botanists. In the year 1805, Mr. Fortin discovered it near Mozambique, and carried an offset from the root to Madras, from which "a plant was raised in the garden of Dr. Armstrong. From a drawing made of this plant, it was ascertained to belong to the natural order of *menispermeæ;* but as the female flowers were wanting, some difficulty was experienced in determining the genus and species." It has, of late years, however, been referred to the genus *cocculus* of De Candolle, and, in the Pharmacopœias of the United States and of London, the plant is recognized as the *cocculus palmatus.* The root, which alone is employed in medicine, is imported in transverse slices, from an eighth to a quarter of an inch in thickness. The bark of the root is rugous, thick, and of a greenish, verging to an obscure brown color. The internal, or parenchymatous part of the root is yellowish. In general there are three distinct parts composing this root, the bark, the woody part, and medullary portion.* "Those pieces are to be preferred which have the brightest yellow color, are most compact and uniform in their texture, and are most free from the worm holes by which the root is apt to be penetrated." It has a faint aromatic odor, and is intensely bitter and slightly acrid in taste. According to an elaborate analysis made of this root by M. Planche, it contains a kind of animal matter, which exists in it in very great proportion, and a yellow substance of an intensely bitter taste which readily dissolves in water and alcohol. It also contains a very large portion of starch. By repeated distillation a volatile oil may be obtained from it; and it appears to contain a malate of lime and sulphate of lime.† About one-third of its weight is dissolved by boiling water; its best menstruum, however, is proof spirit, with which it forms a very beautiful and active tincture. More recently Mr. Wittstock, of Berlin, has obtained a peculiar crystalizable principle from the columba, which is intensely bitter, and for which he has proposed the name of *columbin.*‡ "It appears to be the yellow bitter substance of Planche, deprived of a part of its coloring matter." It crystalizes in transparent quadrilateral prisms, possessing no smell, but extreme bitterness. Water, alcohol, and ether dissolve

* Alibert, Mat. Med., tom. i. p. 96.

† Ibid., tom. i. p. 97.

‡ Journ. de Pharm., Fev. 1831.

it but sparingly at the medium temperatures. Diluted acetic acid is the best menstruum; alkaline solutions also dissolve it, from which it is speedily precipitated by acids. It possesses neither acid nor alkaline properties, "and its alcoholic and acetic solutions are not affected by metallic salts, nor the infusion of galls."

This is one of the purest and least astringent and stimulating bitters we possess. It has been prescribed in intermittents, but it does not appear to be particularly efficacious in this disease. It has also been recommended in phthisis; but, from what I have seen of its effects in this disease, I am not induced to believe that it is often useful, or even proper, in this hopeless malady.

The columba has also been recommended in diarrhœa and chronic dysentery. In the chronic bowel complaints of children, from debility of the alimentary canal, much benefit may, indeed, often be derived from this remedy. In the habitual diarrhœa of infants, I have seen much good done by giving once or twice daily a teaspoonful of a mixture composed of half a drachm of extract of columba, dissolved in an ounce of water, to which forty drops of the camphorated tincture of opium is to be added. Columba may also be advantageously employed in cholera infantum, when it assumes the chronic form.

The disease, however, in which it seems most decidedly beneficial, is indigestion. In this complaint it is one of the best tonics we can employ. I have frequently prescribed the columba in union with ipecacuanha, with marked advantage in dyspeptic complaints. Ten or twelve grains of the columba may be given with two grains of the ipecacuanha. It is particularly valuable where there is a disposition to the accumulation of flatus in the bowels. In cases of this kind, Drs. Wood and Bache* strongly recommend an infusion made of half an ounce of columba, the same quantity of ginger, and two drachms of senna, and a pint of boiling water. This should be taken in wineglassful doses, thrice daily. It is to be observed, however, that neither this nor any other tonic can be advantageously or even properly given when the dyspepsia is attended with high irritation of the mucous membrane of the alimentary canal. It is only where the indigestion depends on debility and inactivity of the digestive organs, that articles of this kind can be used with a prospect of advantage.

The dose of the powder is from gr. xv to ʒss; that of the infusion from ℥iss to ℥ii. It may be given in combination with iron, rhubarb, or saline purgatives. The incompatible substances are, infusion of galls and yellow cinchona bark, subacetate and

* United States Dispensatory.

acetate of lead, corrosive sublimate and lime-water. The nitrate of silver, muriate of mercury, or tart. antim. does not affect it.*

Formulæ.

℞.—Pulv. columb.,
—— subcarbonat. ferri,
—— rhæi,
—— zingiberi, āā ʒi.—M. Divide into twelve equal parts. S. Take one three or four times daily.

℞.—Rad. columb. ʒi;
—— zingiberis ʒiii;
—— calam. aromat. ʒss;
Sem. fœnicul. ʒi;
Aq. bullientis ℥vi.—Macerate for two hours. Dose, a tablespoonful four or five times daily.

℞.—Rad. columb. ʒi;
—— rhæi ʒi;
Sem. anisi ʒi;
Aq. bullientis ℥viii.—Macerate for two hours, strain, and add to the infusion,
Syrup. zingiberis ℥iss;
—— papaver. alb. ℥ss.—M. Dose, a teaspoonful to a child from one to three years old. This is an excellent combination in the habitual bowel-complaints of children.

* In France, a spurious columba has been extensively substituted for the genuine root, which, according to M. Guibourt, has become rare in the markets of that country. Though similar to columba in appearance, it is different in properties, and is, therefore, truly an adulteration. It is said to be imported from Barbary, but the plant which yields it is not known. Though in round slices, like the genuine root, it has an epidermis of a *gray fawn* color marked with close and parallel circular striæ; its transverse surface is irregularly depressed: the medullary portion is of a yellowish orange, with a deeper colored circle; the smell is weak, like that of the gentian; the taste *feebly bitter, and rather saccharine;* the powder is of a yellow fawn, instead of a greenish color; but the most striking difference is the total absence of starch, which constitutes one-third of the columba. Iodine, therefore, is an excellent test. If the true columba be moistened with hot water, and touched with iodine, it immediately assumes a blackish color; while the spurious root, treated in the same way, undergoes no change. The latter, also, gives a fine yellow color to ether, which is not the case with the genuine root.—*U. S. Dispensatory.*

GENTIAN LUTEA.—GENTIAN.

This is a perennial plant, indigenous to the mountainous parts of Germany, France, &c. The root, which is the only part employed in medicine, is long, slender, branched, externally wrinkled, and of a grayish-brown color, and of a yellowish color within. Its taste is intensely bitter, but it has no particular smell. Both water and alcohol extract its active principles, but proof spirit appears to be its best menstruum.

According to MM. Henry and Caventou, this root contains a peculiar principle, to which the name of *gentianin* has been given; a fugitive coloring matter, a substance identical with bird-lime, a greenish fixed oil, a free organic acid, uncrystalizable sugar, gum, yellow coloring matter, and lignin. *Gentianin*, in which the active properties of the root are supposed to reside, is a yellow crystalizable neutral substance, very bitter, but without smell, "readily dissolves by alcohol and ether," but sparingly soluble in cold water, more so in hot water, and partially volatilized by heat.

Gentian is amongst the most active and useful of the pure tonic bitters; and is, perhaps, more frequently employed than any other article of this class of remedies. It possesses no astringency whatever; but it appears to be considerably more stimulant in its general operation than the columba. It is more apt than any of the tonic bitters to excite purging; though its effects in this way are seldom manifested, unless it be given in very large doses. Persons of an irritable or excitable habit of body, or of a sanguineous temperament, do not, in general, bear the gentian so well as the columba, from its greater tendency to heat and irritate the general system. From this exciting power, however, it is, on the contrary, peculiarly suitable as a tonic in individuals of a torpid, phlegmatic, and irritable habit. It is especially adapted to cases attended with a torpid and debilitated state of the digestive organs.

The gentian has been successfully employed in combination with astringents in the cure of intermittents. Cullen says he never knew it to fail in curing intermittent fever, when given with galls or tormentil. When given alone, however, its powers are much less certain and useful. Lind, also, commends it as an efficacious remedy in this disease. At present, however, it is very seldom used for this purpose, nor does it appear to be entitled to much credit for its virtues in this complaint.

As a tonic, in general debility or in a weak state of the stomach and bowels, the gentian is an excellent remedy. It is particularly beneficial as a stomachic; and in indigestion it is, perhaps, the

most useful of the bitter tonics. It has also been recommended in gout, particularly in the convalescent state, when much debility of the stomach is present. Gentian is an article in the composition of the famous Portland powder, which appears to have been employed with great advantage in preventing the paroxysms of gout.

The dose of the powdered root is from gr. x to ʒi. It is also given in the forms of an extract, infusion, or tincture, all of which are excellent preparations.* In a large dose it is apt to purge.

The officinal preparations of this root are numerous; the following are the principal: *Extract. gentianæ; tinct. gentianæ; tinct. gentian. compos.; tinct. gentianæ cum ammonia*, Pharm. Gallic.; *tinct. amara; infusum gentianæ composit.*, Lond. Dub. and Edinb. Pharm.; *vinum gentian. compos.*, Ed. Pharm.

Formulæ.

℞.—Rad. gentian. contus. ʒi;
Carbonatis ammon. ʒii;
Alcoholis ℥xxxii.—M. Digest for four days. This combination is much used in France as a tonic in scrofulous affections, and constitutes a highly useful preparation in dyspeptic complaints, attended with acidity in the primæ viæ. Instead of the ammonia, a few drachms of the *corbonate of soda* may be taken.

℞.—Extract. gentianæ ʒi;
Sulphatis ferri gr. viii;
Pulv. ipecac. ʒss;
Mucilage g. Arab. q. s.—M. Divide into thirty pills. Dose, one pill, three times daily.

QUASSIA EXCELSA.—QUASSIA.

The quassia excelsa is a large tree growing spontaneously in Surinam, from which its wood was first brought into Europe in the year 1761.

The wood of this tree, and more especially that of the root, is of a pure and intensely bitter taste, which, according to Thompson, depends on a peculiar bitter principle to which the name of *quassin* has been given. According to Crell and Trommsdorff, the *quassia* contains a greater proportion of gummy matter than of

* "*Brodum's Nervous Cordial* consists of the tincture of gentian, columba, cardamom, and bark, with the compound spirit of lavender, and wine of iron.

"*Staughton's Elixir* is a tincture of gentian, with the addition of serpentaria, orange-peel, cardamus, and some other aromatics."—*Paris's Pharmacologia.*

resinous, and hence they infer that the infusion of it in cold water is its best preparation. The nitrate of silver and the acetate of lead are the only substances, in common use as medicines, which produce precipitates with the infusion of quassia.

The quassia is a very excellent tonic, and may be very usefully employed in all cases where remedies of this kind are indicated. It possesses scarcely any stimulating or heating properties, and is, therefore, peculiarly calculated to improve the digestive powers of the stomach in weak and very irritable subjects. It was at one time a good deal employed in the cure of intermittents. It has, however, not sustained its reputation in this disease, and is now but very seldom employed in its cure. It is said to be very efficacious in suppressing bilious vomitings, attending bilious and putrid fevers. Alibert states that he succeeded in curing a female, by this remedy, of habitual vomiting, which had prevented her for a long time retaining any nourishment on her stomach. He also says, that he has used the quassia with much success in cases of dyspepsia. In the depraved appetite in chlorosis, particularly when there is a disposition to eat dirt, chalk, &c., the quassia is said to be a very efficacious remedy.*

As a stomachic, it is, indeed, one of our best remedies; it is said to be especially useful in indigestion arising from intoxication. When administered in combination with some absorbent, it acts with much advantage in the weakness and languor attending chronic hysteria.†

In diarrhœa from a want of tone in the bowels and stomach, the quassia is an excellent remedy. It has also been recommended in leucorrhœa, gout, cachexy; and Alibert says that it ought to be employed as a prophylactic, by persons who are subject to intestinal worms. It is usually given in infusion. The infusion, made in the proportion of three or four drachms of the wood to twelve ounces of water, may be taken in doses of one, two, or three tablespoonfuls.

Formulæ.

℞.—Rasuræ liq. quass. ℥ss;
Cort. aurant. ʒi;
Rad. rhæi contus. ℈i;
Potassæ carbon. ʒss;
Aq. fontanæ fervid. ℥viii.—M. Macerate for ten hours, then strain, and add
Tinct. cardamom. ℥i.—M. Dose, a tablespoonful twice or thrice daily, in weakness of the digestive functions with acidity.

* Barton's MS. Lect. on Mat. Med.
† Thacher's Dispensatory.

℞.—Extract. quassiæ ℈ii;
Extract. aloes gr. xii;
Pulv. ipecac. ʒss;
Mucilag. g. Arab. q. s.—M. Divide into thirty pills. S. Take one three times daily. I have used this combination with much advantage in debility of the digestive organs, with torpor of the bowels.

QUASSIA SIMARUBA.—SIMARUBA.

This species of quassia is brought from St. Domingo, Jamaica, &c., and is also found growing spontaneously in the southern parts of the United States. The bark and not the wood of this species of quassia is used in medicine. It is inodorous, and exceedingly bitter, without any perceptible astringency. It is of a tough and fibrous texture, of a pale yellowish color, and rough on the external surface. It furnishes a very abundant watery extract, and contains a large portion of mucilage, but very little resin. It does not, like the quassia, strike a black color with the sulphate of iron.

The simaruba has been highly spoken of as a remedy in dysentery and diarrhœa. It has been particularly recommended for its efficacy in the former of these complaints, by Pringle, Lind, Stoll, Zimmerman, Blane, Tissot, Bampfield, &c. The latter writer, in his work on scorbutic dysentery, observes: "The infusion of simaruba, or a decoction of it, has been recommended generally in the obstinate chronic stages of dysentery. (See *Blane on Diseases of Seamen, &c.*) In my practice it has shown great powers, but these were of uncertain benefit. It was too apt to produce constipation, and its painful and disordered consequences." I have myself employed it in this disease, after it had assumed a chronic form, and repeated evacuations had been premised, and the effects have frequently been very beneficial. Alibert says that this remedy has been used with much advantage at the hospital St. Louis, in diarrhœas, following scurvy and intermittent fevers. Although many, and highly respectable testimonies may be adduced in evidence of the usefulness of this remedy in dysentery, it can, most assuredly, not be a proper remedy in the early stage of the ordinary inflammatory dysenteries of this climate. In the typhoid or malignant form of the disease, as it occasionally prevails in hot climates—and in the chronic stage of the more sthenic varieties of the disease, advantage may, no doubt, be derived from it, under judicious management. It is, indeed, probable that the simaruba will, in general, do more good than any other astringent tonic, in instances where remedies of this kind are proper, and it undoubtedly deserves particular attention in this re-

spect. It is said to be particularly useful in the intestinal debility left by an attack of dysentery.

It has also been much recommended in dyspepsia and intermittent fevers; experience, however, has not established its efficacy in these diseases, and it is certainly inferior in this respect to several other articles of this class of remedies. In powder it is given in doses of half a drachm. The decoction, however, is the most convenient form, and it possesses all the powers of the substance.

Formulæ.

℞.—Cort. simarub. ℥ss;
Lichen. island. ℥i;
Aq. bullientis ℥viss. Boil down to one pint; strain and add,
Tinct. nucis moschat. ℥ss;
Syrup. zingiberis ℥ii.—M. Take two tablespoonfuls four times daily.—*Richter.*

℞.—Cort. simaroub. ℥ss;
Lign. campech. ℥i;
Aq. bullient. ℥x. Boil down to ℥viii; strain, and add,
Syrup. papaver. alb. ℥i.—M. Take a tablespoonful four or five times daily.

CROTON ELEUTHERIA.—CASCARILLA.

This is a small shrubby tree, indigenous to Jamaica, Eleuthera, Carolina, Florida, and various parts of South America. There are two varieties of the bark of this shrub brought to this country. One of these varieties consists of cylindrical or rolled pieces, varying in length from half an inch and less, to three or four inches in diameter. Externally, these pieces are of a dull, whitish or grayish-white color, while the internal surface is of a brownish color. The other variety, "which is now most common in the United States, consists entirely of very small pieces, not more than an inch or two in length, very thin, without the white epidermis, not regularly quilled, but curved more or less, in the direction of their length, often having a small portion of woody fibre attached to the inner surface." It does not appear that these two varieties of the bark differ in any degree, in their properties and medicinal powers; and they are, probably, derived from the same species of Croton—the difference in their appearance arising from different modes of collection, or from being taken from different parts of the shrub. The cascarilla is very bitter, and it has a strong aromatic odor, which becomes particularly manifest when burned or heated by friction. It contains a very large pro-

portion of resin, and hence alcohol is its most appropriate menstruum. According to the analysis of Trommsdorff, it contains also, besides resin, a small portion of mucilage, a bitter principle, and a very volatile essential oil.

As a remedial article, this bark was first brought into notice in the year 1692, in a dissertation attributed to a Spaniard of the name of Vincent Garcias Salat. It soon afterwards attracted the attention of many of the most celebrated physicians of Germany,* and was highly praised for its febrifuge powers; which, by some, were affirmed to be superior even to those of the Peruvian bark. Stahl and his followers contributed greatly to its reputation as a remedy in intermittent fevers; and Junker and Alberti spoke in the highest terms of its powers in this disease. It possesses considerable stimulant properties, and is, therefore, peculiarly adapted to cases attended with a sluggish, phlegmatic, and unirritable habit of body. It has been particularly recommended in what have been called putrid or malignant intermittents. The very strong and respectable testimony, which we have in the writings of physicians, in favor of the febrifuge virtues of the cascarilla bark, do not permit us to doubt of its usefulness in this way.

This bark is especially a valuable medicine in weakness of the stomach, attended with flatulent pains, acidity, frequent vomiting, and habitual costiveness from torpor of the bowels. Küglestien asserts that we possess no remedy superior to this bark, in the gastric weakness accompanied with frequent nausea and vomiting, sometimes met with in hysteric and phlegmatic females. Given in combination with valerian, it will often afford speedy and complete relief in such cases.†

It has also been employed in dysentery and diarrhœa, but in neither of these complaints can it be beneficial or even proper, except in the chronic stage of the former connected with great prostration; and in diarrhœa, depending solely on chronic irritation and relaxation of the intestinal canal. Cullen speaks very slightingly of this medicine, but I am inclined to think that his estimate of its powers falls considerably short of its real merits. I have given it in chronic debility of the digestive organs with decided advantage; and in intermittents attended with much general debility and relaxation, I have known it to prove highly beneficial, given in combination with cinchona.

It may be given in powder—in doses of from twelve to thirty grains. The tincture is an active preparation, but the decoction or infusion possesses no very active powers.

* Alibert's Mat. Med.

† Richter's Arzneimittell. B. i. p. 369.

Formula.

℞.—Rad. cascaril. ℥ss;
Rad. valerian. ℥i;
Aq. bullient. ℥xii. Macerate for ten hours, then add,
Syrup. zingiberis ℥ii;
Tinct. cascarillæ ʒii.—M. Dose, a tablespoonful three times daily. This is an excellent combination, in gastric debility, with flatulency and general languor.

SECONDARY VEGETABLE TONICS.

PRUNUS VIRGINIANA.—WILD CHERRY.

This is a large and handsome tree, indigenous to the United States, in many parts of which it is found in considerable abundance. The bark of the tree, which is the part employed in medicine, has a bitter, astringent, and slightly aromatic taste. Its smell resembles that of those substances which contain prussic acid, particularly the peach kernel. This bark, indeed, contains a very considerable portion of the prussic acid, a circumstance upon which I am inclined to believe its remedial powers mainly depend.

When taken into the system, it produces a slight increase of the action of the heart and arteries, and induces, in some individuals, considerable drowsiness. When continued for some time, and not in very large doses, it gives tone to the stomach, and, by this effect, vigor to the general system. When, however, it is taken in *large* quantities, and frequently repeated, it weakens the digestive organs, and produces an effect upon the action of the heart and arteries, the very reverse of a stimulant. In my own person I have several times reduced my pulse from seventy-five to fifty strokes in a minute, by copious draughts of the cold infusion, taken several times during the day, and continued for twelve or fourteen days. This effect has not, I believe, been noticed before; but, from much experience with it, I am strongly inclined to believe, that we may control the action of the heart and arteries, to a considerable extent, by the use of this substance.

The wild cherry bark has been highly recommended in the cure of intermittents. I have myself employed it a good deal, while residing in the country, and in the majority of cases with success. It has appeared to me most useful in those cases in

which the bark did not produce its usual beneficial effects; and in one instance, where the bark, arsenic and mercury had all been tried ineffectually, the patient was finally cured by the use of the wild cherry bark infusion.

In phthisis, also, this bark has been employed with decided benefit. I have prescribed it often in hectic fever, and in some instances with evident advantage. There is, indeed, no difficulty in perceiving how this bark may produce beneficial effects in cases of this kind. It is well known now, that the prussic acid, when judiciously administered, is capable of moderating, nay, even of removing, all the symptoms attending the early stage of pulmonary consumption. The testimony we have is too respectable and numerous to admit of any reasonable doubt as to its powers in this way. Now, the wild cherry tree bark contains no inconsiderable portion of this acid, and it is obvious, therefore, by using the infusion of it, we employ a medicine which contains prussic acid, together with a bitter and an astringent principle, dissolved in a considerable portion of water. These ingredients would appear, I think, particularly calculated to produce good effects in pulmonary consumption, by at once lessening the irritability of the system, which the prussic acid does in an eminent degree, and supporting the strength of the patient by the tonic principles which it contains. I have already stated the power which this remedy possesses, when taken in very large doses, of diminishing the action of the heart and arteries, and it is, doubtless, by its controlling influence in this way, in consequence, perhaps, of the prussic acid which it contains, that its action has been found so useful in diseases attended with an irritated or hectic state of the circulation. Whether it be ever capable of giving perfect relief in phthisis, is extremely doubtful, but of this I am satisfied from repeated experience, that it is one of our most valuable palliatives, and well deserving of attention in the present disease. Its effects, indeed, upon phthisical patients, are very similar to those of the prussic acid. It frequently lessens the frequency, tension, and irritated state of the pulse; moderates the cough, and profuse nocturnal perspirations, checks the diarrhœa, and sustains the general strength of the system.

In chronic hysteria, I have, in several instances, prescribed this remedy with great relief to the patients. I have found it equally useful in wandering rheumatic pains and swellings, attended with a small, corded, and frequent pulse, and general debility of the system.

The wild cherry bark has also been recommended as a very useful remedy in asthma. Of its powers in this complaint I can say nothing from my own experience. It is to be given during the interval of the fits, and in large doses.

When given in moderate doses, it often produces excellent effects in dyspepsia. I have, however, found that large and frequent doses of this remedy have a tendency rather to weaken than to invigorate the digestive powers of the stomach. This I have particularly observed in my own case.

Very excellent effects are said to have been produced by washing irritable and fungous ulcers with a decoction of this bark.*

The bark of the root is stronger than that of the trunk. To certain animals the leaves of the tree are said to be poisonous. The cherries have been advantageously used as a domestic remedy in scurvy and dysentery.

The dose of the powdered bark is from ʒss to ʒii. The decoction does not appear to possess much strength. The prussic acid, which appears to be its most important part, is driven off by boiling. The cold infusion, however, is an excellent preparation. An ounce of the bark is to be infused in a pint of cold water, for twenty-four hours. Dose, a wineglassful every four hours.

CORNUS FLORIDA.—DOGWOOD.

This is a common and well-known tree throughout the United States. It appears, from the experiments of Dr. John M. Walker,† that the bark of this tree differs but very little in chemical composition from the Peruvian bark, and experience has fully demonstrated that, in their operation on the system, these two articles possess a very close resemblance. In its sensible qualities, too, the dogwood bark is very much like the cinchona; it has a bitter, astringent, and slightly aromatic taste. Its astringency is, however, stronger than that of the Peruvian bark.

In the cure of intermittents, the dogwood bark has been a good deal used in some parts of this country; and from the concurrent testimony of those who have employed it, as well as from my own experience, I am persuaded that of all our indigenous tonics, this bark is the most useful in the present disease.

When employed in a recent state, it is said to be apt to disagree with the stomach, and to produce pain in the bowels. To obviate this, it is only necessary to give it in conjunction with a few drops of laudanum; or to employ the bark after it has been collected for some time. Thirty-five grains of the dogwood bark, are about equal to thirty of the cinchona. An infusion of the flowers has been used with advantage in flatulent colic. "A decoction of the small branches and buds agrees well with weak

* Thacher's Dispensatory.

† Inaugural Dissertation. Philadelphia, 1797.

stomachs, and is, perhaps, the most eligible form of exhibiting this medicine."*

There are two other species of cornus; the *cornus circinata*, and *cornus sericea*, which have been introduced into the United States Pharmacopœia, fifteen feet high. The bark of the branches is covered with numerous little warty excrescences, and the leaves are large, oval-pointed, and waved on the edges, with a down on the under surface, particularly along the nerves. The flowers are white, and disposed in depressed cymes. The berry is blue. When dried, the bark affords a powder resembling that of ipecacuanha in color. Its taste is bitter, considerably astringent, and slightly aromatic. In chemical composition it does not appear to differ from the C. florida. It possesses, also, similar medicinal virtues, and is employed in the same doses, and in the same diseases. The *Cornus sericea* rises from about five to ten feet in height. The stem is covered with a reddish, shining bark, and the young shoots and branches are distinctly pubescent. The leaves are opposite, petiolate, ovate-lanceolate, pointed without, entire along the edges, and covered on the under surface with a conspicuous brownish pubescence. The flowers are small, white, and aggregated into terminal cymes. The berries are of a light-blue color. The bark of this species is in all respects equal to that of the C. florida. When digested in proof spirit, it produces a beautiful red tincture. The dose is the same as of the other species.

These species of cornus may be advantageously given with aromatics and other tonics. An excellent mode of prescribing them in intermittents, is in union with Virginia snakeroot.

SALIX ALBA.—WHITE WILLOW.

There are three species of willow recognized in the British Pharmacopœias, as possessing useful medicinal properties, namely, the *S. alba*, *S. caprea*, and *S. fragilis*. Of these, the salix alba is the only one which has been admitted into the Pharmacopœia of the United States. This species was introduced into this country from Europe, and is now abundantly met with in the eastern and middle states. It grows from twenty to forty feet in height, "with numerous spreading branches, the younger ones of which are invested with a fine silky down. The bark of the trunk is rough, and of a yellowish-brown color," whilst that of the young branches is smooth, and of a greenish-yellow. The leaves are alternate, with short foot-stalks, long-canceolate,

* Collections, &c.

very pointed, acutely notched along the margins, pubescent on both sides, and without stipules or leaflets at the base of the foot-stalks.

The bark of this species of willow has a faint aromatic odor, and a peculiarly bitter and astringent taste. Water readily extracts all its active properties, and forms, by boiling, a reddish-brown decoction. According to Pelletier and Caventou's analysis, it contains tannin, resin, a yellow coloring matter, gum, and an acid. M. Leroux has recently obtained a peculiar crystalizable principle from this bark, in which the active or medicinal powers of the willow reside, and which has, therefore, received the name of *salicin*. This substance is in the form of fine white crystals, readily dissolved by water and alcohol, but wholly insoluble in ether. It has a very bitter taste, and partakes of the odor of the willow bark.*

The bark of the willow possesses excellent tonic properties, and has been particularly recommended for the cure of intermittents. I have used it in several cases of this disease with speedy and complete success. In chlorosis, too, when wholly free from febrile irritation, it is said to be peculiarly beneficial. *Salicin* has recently been recommended as an excellent substitute for the sulphate of quinia, in the cure of intermittents. Magendie states that he has found it a valuable remedy in this disease, and that "he has seen three doses, of six grains each, arrest the progress of the fever." We have, also, the testimony of MM. Miguel, Huscon, Bally, Girardin, Cognon, and others, in favor of its efficacy in this and other maladies requiring remedies of this kind. In general, from twenty to thirty grains of salicin are sufficient to arrest the course of the fever.

CHIRONIA ANGULARIS.—CENTAURY.

This is a beautiful plant, and exceedingly abundant in some parts of the United States. The root, which is annual, consists of yellowish fibres; the stem is erect, from one to two feet high, herbaceous, smooth, and four-sided; the branches are opposite and auxiliary; the leaves opposite, ovate, amplexicaule, and

* Messrs. Fisher and Tyson recommend the following plan for procuring the *salicin*. Boil willow bark with caustic lime in water; filter the decoction, and add sulphate of zinc until it ceases to produce a precipitate; filter the liquid again, and evaporate it to the consistence of an extract; treat this residue with alcohol. "The tincture thus obtained, if carefully evaporated, yields crystals of salicin, which may be purified by washing with a saturated solution of the same principle in cold water."—*Journ. Coll. Pharm.* iii. p. 214.

three-nerved. The flowers, which are numerous, grow at the extremities of the branches, and are of a beautiful rose-color above, but pale, and in many specimens nearly white in the centre underneath. The calix is much shorter than the corolla; its segments are very acute. The centre of the corolla is marked by a pentangular star, of a yellow color, bordered with green. The petals are obovate, and sometimes nearly lanceolate.

This plant is one of the most useful and agreeable of our indigenous vegetable bitters; and is decidedly more valuable than the centaury (chironia centaurium) of Europe. It is a pure bitter, possessing a slight aromatic flavor, and by no means offensive to the stomach. Both alcohol and water extract its active principles. It does not appear to possess any astringency. In domestic practice it is much used as a stomachic for weakness of the digestive organs; and I know of no bitter which is more grateful and effectual in cases of this kind, than this one. It has also been a good deal used in some parts of the country in intermittents. I have myself employed it in some instances, but I do not remember any case in my practice which was cured by it. I knew a country practitioner, however, who was in the habit of giving this remedy, conjointly with *calamus aromaticus*, in intermittents, and with very considerable success.

It is commonly given in the form of strong infusion. Of this, from a half to a whole gill may be taken frequently during the day. The dose of the powder is from twenty to thirty grains.

There is an excellent figure of this plant in Dr. Barton's Vegetable Materia Medica of the United States, vol. ii.

LIRIODENDRON TULIPIFERA.—TULIP TREE.

This is one of the largest and most beautiful of American forest trees. It rises to the height of eighty, ninety, and even one hundred and forty feet, putting forth, about the middle of May, an abundance of superb flowers, marked with green, yellow, and red streaks, which, together with its beautiful foliage, give to the tree a very magnificent appearance. The bark, which is the part employed in medicine, is of a strongly bitter, and slightly aromatic taste. According to the analysis of Dr. Rogers,* it contains gum, resin, muriatic acid, iron, calcareous salt, mucus, and fecula. Professor Emmet, of the University of Virginia, has recently obtained from it a peculiar volatile principle in which the medicinal powers appear to reside, and which has received the name of *liriodendrin*. When pure, this prin-

* Inaugural Dissertation. Philad. 1802.

ciple is solid white, crystalizable, insoluble in water, soluble in alcohol and ether, and fusible at a temperature of 180°; volatilizable and partially decomposed at 270°. It has a weak aromatic odor, and a pungent bitter taste. It does not unite with alkalies; these, on the contrary, precipitate it from the infusion or decoction of the bark "by combining with the matter which renders it soluble in water." It is, likewise, incapable of uniting with acids, and is precipitated from its alcoholic solution by water. The active properties of the bark escape, in part, by boiling. They are much weakened, and finally almost entirely dissipated by long keeping. This bark has been long employed, both in domestic and regular practice in the United States, and it appears from the testimony which has been published in favor of it, to be well entitled to the attention of the profession.

This bark possesses considerable stimulant properties, but it is chiefly on account of its tonic effects that it deserves notice. It acts also occasionally as a diuretic, and in general produces very conspicuous diaphoretic effects, when largely administered. The bark of the root appears, however, to be less stimulant and more purely tonic, than that of the trunk or smaller branches.

Given in union with dogwood, or the prinos verticillatus, it has been employed with much success in the cure of intermittents. The late Dr. Rush employed it, as he states, "with as much satisfaction as any of the common bitters of the shops."*

Dr. J. T. Young, in a letter to Governor Clayton of Delaware, says, "I have prescribed the poplar bark in a variety of cases of intermittent fever, and can declare from experience that it is equally efficacious with the Peruvian bark, if properly administered."† As this bark is, however, considerably stimulant, it should never be given where the intermission is marked by symptoms denoting a phlogistic tendency in the system. Bleeding and purging are necessary preliminaries to the employment of this remedy, where the habit is inflammatory.

It has also been much recommended in chronic rheumatism and in gout,‡ and from its manifest tendency to procure diaphoresis, together with its tonic operation, there can be little doubt of its occasional usefulness in affections of this kind. From these combined properties it also often acts with great advantage in the advanced stage of dysentery.§ In this disease I have repeatedly employed it in conjunction with the ulmus aspera, in the form of decoction, and in general the effects were very satisfactory.

* Transactions of the College of Physicians of Philad., 1798.

† Carey's American Museum, vol. xii.

‡ Barton's Collections.

§ Thacher's Dispensatory.

Dr. J. T. Young, whom I have already quoted, speaks in very high terms of this remedy in the cure of hysteria. "I can assert from experience," says he, "there is not in all the materia medica a more certain, speedy, and effectual remedy in hysteria, than the poplar bark, combined with a small quantity of laudanum."

Dr. Young also states, that he has used this bark with much advantage as an anthelmintic. "I have never known it to fail," he observes, "in a single case of worms which has come under my observation." I have given it for this purpose in several instances, without deriving any good effects from it.

In a debilitated state of the stomach, the powdered bark of this tree, in union with steel dust, has been prescribed with very great advantage.* The bark may be given in substance, tincture, infusion, or decoction. In substance, however, it acts with most power. The dose of the powdered bark for an adult, is from thirty to one hundred and twenty grains. The tincture may be given in teaspoonful doses. If it produces purging and griping a few drops of laudanum should be added to it.

ANTHEMIS NOBILIS.—CHAMOMILE.

CHAMOMILE is one of the most ancient articles of the materia medica. It was employed by the Egyptians as an external application in the cure of fevers; and it appears from the Greek writers, that it was held in very great estimation by them.†

It does not appear that chamomile flowers have as yet been subjected to any particular analysis. They have been ascertained, however, to contain a considerable portion of bitter extract, and an essential oil of a beautiful sapphire blue, or of a greenish brown color, resin and tannin. By being exposed to the light and air, this oil is liable to undergo changes.

Chamomile flowers were at one time much prescribed for the cure of intermittents, and much respectable testimony is extant in favor of their powers in this complaint. We are informed by Dr. Cullen that Dr. Pitcairn thought them quite equal in this respect to the Peruvian bark, and Hoffmann considered them very efficacious. Cullen, also, employed them with success in this disease. He states, however, that their employment is frequently attended with the inconvenience of readily running off by stool, to obviate which he usually gave them with an opiate or some astringent.

As a stomachic bitter, chamomile flowers are much employed,

* Thacher's Dispensatory.

† Paris's Pharmacologia.

and their effects in this way are commonly decidedly beneficial. They are also an excellent remedy in spasmodic and flatulent colics; in hysteria, attended with habitual weakness of the digestive organs, and in restraining violent bilious vomitings. When employed for restraining vomiting, a *weak* infusion must be employed: a strong one having the property rather of exciting than of allaying vomiting. The infusion is much employed to promote the operation of emetics, but for this purpose it ought to be used strong.

Chamomile flowers are often employed in colds and catarrhs, as a gentle diaphoretic, and they indeed seldom fail in producing this effect. The essential oil is used as a carminative, and cordial diaphoretic. The leaves and flowers of chamomile have sometimes beeen used as an external discutient application; and the infusion of them is said to be very beneficial when used in the form of a clyster, in dysentery and colic. The incompatible substances are, the soluble preparations of iron, nitrate of silver, oxymuriate of mercury, acetate and subacetate of lead, solutions of isinglass, infusion of yellow Peruvian bark.

In substance these flowers may be given in the dose of a drachm or more; but they are usually prescribed in the form of an infusion. They give out their virtues both to water and rectified spirit.

MINERAL TONICS.

FERRUM.—IRON.

Among the mineral tonics, iron undoubtedly holds the first rank, whether we consider it in relation to its general tonic effects, or the extent and variety of its remedial applications.

Cullen thought that iron is totally inactive in its metallic state, except it meet with an acid in the stomach, to corrode and render it soluble.

This idea is, however, without foundation, as it is now sufficiently ascertained that the gastric juice readily dissolves iron in its metallic state, "without the intervention or aid of the acetous, or any other acid present in the stomach."*

The effects of iron on the system are those of a slow but permanent tonic, increasing the fullness and frequency of the pulse,

* Dr. Barton, in a note to Cullen's Mat. Med.

rendering the blood more florid, and imparting permanent vigor and tone to the general system. It is therefore obvious, that this metallic tonic is peculiarly adapted to cases of debility attended with a weak and sluggish pulse, and a pale, cold and relaxed state of the body.

One of its earliest remedial applications was for the purpose of restraining hemorrhages; and in these cases it may be injurious or beneficial, according to the particular state of the system attending the complaint. In what are called active hemorrhages, this remedy can hardly fail to prove pernicious, unless some of its astringent preparations be employed. In those chronic hemorrhages, however, which depend on a laxity of the animal fibre, and are accompanied with a pale and cachectic state of the body, iron, either in its metallic form, or in that of its milder preparations, is a remedy of unquestionable benefit. It is peculiarly advantageous in those cases of chronic uterine hemorrhages which occur in females somewhat advanced in life, and of a relaxed and debilitated habit of the system. In cases of this kind I have done much good by exhibiting small doses of iron and Peruvian bark, and interposing occasionally some active astringent, when the discharge became alarming. M. Alibert says, that he has employed this remedy with much success in the hemorrhages which accompany scurvy.*

In general, iron is a very important remedy in all diseases attended with a feeble and cachectic state of the system. In chlorosis, it is justly considered as one of our most useful remedial means. In this affection there is a great want of tone and activity in the system; everything indicates languor and relaxation of the vital energies. The pale and leaden hue of the countenance, the flaccidity of the skin and muscles, the swellings of the feet, the anorexia or depraved appetite, the indisposition to active exercises; all these symptoms point out the necessity of invigorating measures, and none appears to be so generally useful as iron, aided by the gentle exercise of gestation. This, however, applies only to the strictly chronic cases of the disease. In some instances of chlorosis, there exists a considerable degree of febrile irritation, or so strong a tendency to pyrexial excitement, that tonics of every kind are wholly out of the question. Instances of this acute character must be managed by mild aperients, pure air, gentle exercise by gestation, and a mild but nourishing diet.

Iron is also much prescribed as an emmenagogue; and it is, in fact, often the most effectual remedy we can employ. It must be observed, however, that it is only in those cases of amenorrhœa which are attended with great debility and relaxation, that it can

* Alibert, Elémens de Thérapeutique, tom. i. p. 180.

be employed with advantage. Where the complaint is attended with an opposite state of the system, this remedy is not only useless, but absolutely pernicious. The emmenagogue effects of iron depend on its general tonic powers; and it is only in proportion as its general roborant effects are produced, that it acts beneficially in restoring the suppressed menses in cases of this kind.

Iron has been highly recommended in scrofulous affections. Alibert says, "there are few remedies more useful in scrofulous complaints than iron;"* other practitioners have added their testimony in favor of its remedial powers in affections of this kind.

Of late it has also been particularly recommended in the cure of cancerous ulcerations. Dr. Carmichael, of Dublin, has written a work† expressly on the use of iron in the cure of cancerous affections. Respectable as is the testimony of Dr. Carmichael, more extensive diversified experience is wanting, before we can pronounce on the real value of this practice. It is not, however, just to oppose speculative doubts to the facts of direct experiment; and we have, therefore, no right to invalidate the large body of evidence offered by Dr. Carmichael in favor of this remedy in cancer, until ample and diversified experience shall have shown it to be inefficacious. Dr. C. recommends the iron to be given in very large doses, and to be continued for a long time; the ulcers are to be sprinkled with the powdered carbonate of this metal, or touched with the muriated tincture.

In atony of the stomach and bowels, chalybeates are often exceedingly useful, when given in combination with bitters. This remedy has also been recommended in dropsy. Sydenham proposed its employment in the commencement of this disease, on the supposition that it depends essentially on a weak and watery state of the blood. "Steel," he says, "is the chief corroborative in the beginning of dropsy, for it heats and invigorates the blood." It is, however, well known now, that this disease is very generally connected with a phlogistic condition of the system, and where this is the case, the use of iron is obviously improper. In anasarcous swellings, from general debility, we may readily conceive that this remedy may produce excellent effects. Alibert‡ mentions the case of a weak and delicate female, laboring under anasarca, who was constantly much relieved by the black oxide of iron; and Dr. Robert Archer has reported a case of ge-

* Elémens de Thérapeutique, &c., tom i. p. 181.

† An Essay on the Effects of the Carbonate and other Preparations of Iron in Cancer. 1809.

‡ Elémens de Thérapeutique, tom. i. p. 180.

neral dropsy, in a soldier, which was effectually cured by the black sulphuret of iron.*

Mr. Halle describes a singular affection under the name of *anemia*, (privation of blood), which, in the year 1804, attacked all the workmen in a mine of *anthracite*, near Valenciennes, and which is represented as offering symptoms very analogous to those of chlorosis. In this malady he administered iron filings, in combination with Peruvian bark, with the happiest effects. Other physicians employed iron with equal success in this disease. M. Leblen, physician of the hospital at Dunkirk, to which some of the sick were taken, administered the red oxide of iron with perfect success.†

In another place I shall speak of the anthelmintic powers of this remedy.

The filings of iron may be taken from twenty grains to a drachm. It is generally joined with some aromatic substance, and may be very conveniently given in the form of an electuary. Care should be taken that the filings be well purified by a magnet, as they are apt, when procured from workshops, to be mixed with the filings of other metals, particularly copper. "For pharmaceutical purposes, iron wire should be preferred, as being the most pure, since the softest iron only can be drawn; and Mr. Phillips has shown us, in experiments upon the '*ferrum tartarizatum*,' that soft iron is more easily acted on by tartar."‡

The preparations of this metal are very various; of these I shall, however, mention only such as are considered the most important, and fully capable of affording all the advantages which can be derived from chalybeate remedies.

Ferri subcarbonas.—Carbonate of iron.—Rubigo ferri.—This is a dark-brown powder, destitute of odor, and has a slightly styptic taste. It consists of a mixture of peroxide, protoxide, and subcarbonate of protoxide of iron, in proportions subject to variation, according to the temperature at which the preparation is made. Acids act upon it, and dissolve it with effervescence; in water, however, it is wholly insoluble.

This is, perhaps, the best preparation of iron in the majority of cases, for which martial remedies may be thought necessary. It is by no means unpleasant to take, and sits easily on the stomach. In certain cases, however, where a costive habit of body exists, this preparation is apt to increase the confined state of the bowels,

* American Medical Recorder, vol. ii.

† Bibliothèque Médicale, tom. vi. pp. 195 et 342, et tom. viii. p. 297. Vide Traité de Mat. Méd., par C. J. A. Schwilgue, tom. i. p. 310.

‡ Paris's Pharmacologia.

and when this is the case, we ought to employ the filings instead of the rust.

The carbonate of iron has lately been recommended as a very efficacious medicine in tic douloureux. Mr. B. Hutchinson has published a pamphlet, in which he adduces many examples of the efficacy of this remedy in this disease. Mr. Richmond, also, has lately reported a case which was promptly relieved by the carbonate of iron, after a great variety of remedies had been ineffectually tried. He prescribed it in drachm doses three times a day.*

It may be given in the form of pills, or powder, combined with aromatics, in doses of from gr. vi to lx.

Ferri sulphas.—Green vitriol.—Copperas.—The sulphate of iron consists of green-colored, transparent, rhomboidal crystals. When exposed to the air they effloresce, and when subjected to a high temperature, they are deprived of their acid, leaving a peroxide of iron, which constitutes the *colcothar* of vitriol. The sulphate of iron dissolves in two parts of water at 60°, and in three-fourths at 212°. In alcohol it is insoluble, unless the iron be further oxidized, when it undergoes solution in this menstruum.†

This preparation possesses all the powers of iron, and may be employed with advantage where chalybeates are indicated. Its employment, however, requires much more caution than the preceding preparation; for in large doses it is apt to produce pains in the stomach and bowels, and may excite very alarming symptoms. It has of late years been strongly recommended in cases attended with chronic irritation, or inflammation of the mucous membrane of the alimentary canal. Abercrombie and Armstrong give it in doses of from one to two grains, with five or six grains of aromatic powder, several times daily. I have employed this preparation in cases of this kind, with decided advantage, but seldom in larger doses than one grain.

Besides its tonic properties, it is also powerfully astringent, and answers very well in solution as a wash for indolent and fungous ulcers. It is also a good application to herpetic eruptions.

It is given in the dose of gr. i to v in combination with rhubarb, aromatic powder, myrrh, &c.

The incompatible substances are "salts whose base forms an insoluble compound with sulphuric acid; the earths, the alkalies, and their carbonates; borate of soda, nitrate of potass, muriate of ammonia, tartrate of potass, and soda; acetate of ammonia, nitrate of silver, subacetate and acetate of lead, and soaps."

* Med. and Phys. Journal, No. cclxxi. p. 271, for Sept. 1821.

† Paris's Pharmacologia.

Ferrum ammoniatum.—Flores martiales.—This salt is obtained in the form of small granular crystals, which deliquesce on being exposed to the air. It is of an orange-yellow color, of a styptic taste, and of an odor similar to that of saffron. The chemical composition of this salt appears to vary considerably with regard to the proportion of the substances that enter into it, according "to the degree of the heat and time employed for its preparation." It would appear to consist of submuriate of ammonia and submuriate of iron, with the iron in a state of red oxide. Four drachms of this substance are dissolved in one ounce of water. Alcohol dissolves it readily.*

This preparation possesses the tonic virtues common to the other martial remedies. In some instances, however, where we wish to avoid constipation, it is preferable to the rust; for although it does not act sensibly as an aperient, it has no constringent powers, and therefore does not interfere with the regular action of the bowels, as is sometimes the case with the rust.

The dose is from two to ten or twelve grains, in the form of a bolus.

Ferrum tartarizatum.—This preparation consists of brownish green-colored powder, having no odor, and a taste slightly styptic. It dissolves with great ease in water, the solution remaining a long time without undergoing any changes.†

This is an excellent preparation of iron. A watery solution of it is recommended by Dr. Bateman as a chalybeate peculiarly suited, from its tasteless quality, to the palates of children, and as being more efficacious than the vinum ferri. Its qualities have also been particularly commended in a communication from Dr. Birbeck, published in the London Medical Review.‡

The incompatible substances are "a strong acid, lime-water, hydro-sulphuret of potass, astringent vegetables. The fixed alkalies and their carbonates decompose the solution very slowly, unless heated; but ammonia and its subcarbonate produce upon it no effect, whether it be hot or cold." Dose from gr. x to ʒss.

Phosphas ferri.—Phosphate of Iron.—The phosphate of iron is a preparation which, like the preceding one, has been but lately introduced as a remedial article. It consists of a powder, either of a blue or yellow color, according to the mode in which it is prepared. It has no odor, and little or no taste. The blue phosphate is considerably stronger than the yellow. The latter may be given in doses of from twenty to sixty grains, three or four times a day; but the former cannot be administered beyond

* Paris's Pharmacologia.

† Ibid.

‡ No. xix., July 1819.

eight or ten grains, without being apt to excite nausea and vomiting.

The phosphate of iron is considered by those who have employed it an excellent chalybeate. It is said to be particularly serviceable in amenorrhœa, attended with weak digestive power. It has also been administered with very favorable results in obstinate cutaneous eruptions, chronic rheumatism, and scrofula. This is the preparation chiefly recommended by Dr. Carmichael for the cure of cancer.

Ferri Ferrocyanas.—Ferrocyanate of Iron.—Prussiate of Iron.—This preparation of iron has been lately employed with much success in the treatment of intermittent fevers. Dr. Zollickoffer of Baltimore was the first who noticed its powers in this way. He relates a number of cases in which it was successfully used.* He gave it in doses of from four to six grains every four hours. I have known this remedy to be employed with considerable success, by several practitioners of this city. I have prescribed it in five or six cases, in three of which it removed the disease very promptly. In cases of children, it is a very convenient medicine, being destitute of taste or smell, and the dose forming but a very small bulk.

The prussiate of iron has also been strongly recommended in passive menorrhagiæ. In the menorrhagiæ which occur in weak, relaxed and irritable females, about the final cessation of the menses, this article is, indeed, to be accounted amongst our most useful remedies. In a chlorotic state of the system, attended with torpor of the bowels, and obstruction of the catamenia, I have employed a combination of this preparation and aloes with peculiar advantage. Three grains of the ferrocyanate of iron, with a grain of aloes, form a proper dose. It should be taken three times daily, continued for several weeks. In general, this is decidedly the best ferruginous tonic, where, along with debility and relaxation, there is great irritability of the nervous and sanguiferous systems. The prussic acid which enters into its composition would seem to be separated by the action of the stomach and to exert its peculiar sedative powers on the nervous system.

CUPRUM.—COPPER.

Copper has a slightly styptic taste, and a peculiar, faint, nauseous smell. It is said by some writers that this metal is perfectly inert when received into the stomach in its metallic state. Mr. Drourard convinced himself of its innocence by administering

* American Medical Recorder, vol. v. p. 540.

the filings to dogs; in no instance did it produce any injurious consequences. Indeed, we often see children who have swallowed copper coins without any perceptible effects on the system. In cases where it has proved deleterious, an acid probably existed in the stomach, by which the metal was converted into a soluble salt, and thus rendered active. Others, however, assert that it is poisonous in its metallic state. It is said to be acted on by the gastric liquor, and rendered active. This may be the case; but it is extremely probable that the copper is not dissolved in its metallic state, but in that of an oxide, to which it was previously converted by the fluids in the stomach.*

In its metallic state copper was formerly employed as a remedy in rheumatism; and Cothenius recommends its filings in the cure of hydrophobia. At present it is, I believe, never prescribed in the metallic state. It is susceptible of a variety of chemical preparations, some of which are remedies of undoubted utility.

Copper does not, however, manifest any particular tendency to invigorate the muscular system; and still less, perhaps, to increase the activity of the digestive organs. It is upon the nervous system especially that its tonic influence is exerted; and it is chiefly in diseases depending on a weakness or morbid irritability of this system that its remedial powers are manifested.

Cupri sulphas.—Blue vitriol.—Having already noticed this article as an emetic, I shall here speak only of its remedial powers as a tonic and alterative. As such it has been particularly recommended in the cure of intermittents, by Dr. Donald Monro and others. Richter avers that he has succeeded in curing intermittents with this article given in combination, after all the other remedies, usually relied on in this disease, had been ineffectually employed. We have also the authority of Fr. Hoffmann, (Med. Ration. et System., tom. ii. cap. viii. p. 290;) Adair, (Duncan's Med. Commentar., vol. ix.;) and Hahnemann, in favor of the excellence of this article as a remedy in intermittents. Hoffmann (Hufeland's Journal) speaks in the highest terms of the usefulness of the sulphate of copper in bronchitis and tracheitis, or croup. He asserts that when given in doses varying from a quarter to

* Dr. Paris mentions a striking instance in proof of the inertness of copper when taken into the system in its metallic state. "A young woman," says he, "swallowed six copper penny pieces with a view of destroying herself; she was attended by Dr. Maton and myself, in the Westminster hospital, for two years, for a disease which we considered visceral, but which was evidently the effects of *mechanical* obstruction occasioned by the coin. After a lapse of five years she voided them, and then confessed the cause of her protracted disease, during the whole course of which no symptom arose which could in any way be attributed to the poisonous influence of copper.

half a grain every two hours, according to the age of the patient, in the commencement of the complaint, it often produces the happiest effect. He declares that he has often succeeded in curing well-marked cases of tracheitis by this remedy alone, without any depletion whatever. (Harless, Rhein. Jahrb., b. ii.) Nyborg confirms the experience of Hoffmann in relation to the efficacy of this remedy in bronchial inflammation (Hufeland's Jour., b. 57); and other German writers have published statements of a similar tenor.

Dropsy also is said to have yielded to the powers of this remedy. Gardane, (Med. and Philos. Comment., vol. iii.,) Chalmers Wright, (Lond. Med. Jour., 118,) speak well of its powers in hydropic affections connected with great relaxation and debility. Wright gave half a grain of this preparation, with the same quantity of opium, gradually increasing the dose of the former to one grain, twice daily. In scrofulous phthisis pulmonalis, the sulphate of copper has been highly praised by many writers. Curri, Senter, Simmons, Adair, and Jahn, have published accounts tending to show its usefulness in this affection. Jahn says, he has known great benefit derived in this disease, from a combination consisting of one drachm of sulphate of copper, the same quantity of powdered cinnamon, two drachms of the extract of cicuta, and two grains of opium, divided into two grain pills; of which four are to be taken three times daily. In the cure of epilepsy, this remedy was, at one time, a good deal prescribed. Dr. Cullen, before he became acquainted with the cuprum ammoniacum, gave it in this disease and in hysteria, and he states that its effects were often highly beneficial. This salt has also been commended for its effects in resolving scrofulous swellings. Dr. Parsons speaks highly of it in this respect. Chalmers prescribed it with success in colica pictonum. He gave a wineglassful every hour of a solution of twenty grains of blue vitriol in a pint of water, until vomiting was produced. This is to be repeated until the disease disappears. Violent vomiting and purging generally ensue during the first forty-eight hours; but these effects gradually subside along with the symptoms of the disease. Blood-letting is to be employed along with the vitriol, if fever attends the disease. Adair gave it with advantage in other varieties of colic and in dysentery. In chronic diarrhœa, depending on ulceration of the mucous membrane of the bowels, this article has of late been strongly recommended by several English writers; and my own experience enables me to speak, very favorably, of its power in this affection. Half a grain in the form of a pill is to be given three times daily, and the dose afterwards gradually increased to two, or even three grains. It should be given in combination with opium. Dr. Elliotson has published some ob-

servations illustrative of the good effects of this article in this disease. (Med. Chir. Trans., vol. xiii. p. 2, 1827.) As an external application to chancre, and other venereal ulcerations, it often produces excellent effects. For this purpose it is best employed in solution, in the proportion of about five grains to one ounce of water. When we wish to use it for the purpose of destroying the surface of the chancre, it may be applied in substance, like caustic. It also forms an excellent injection for gleety and leucorrhœal discharges. Dr. J. Foot, of London, in his late works on the venereal disease, recommends in the strongest terms, the following injections, in gonorrhœa, after the inflammation has been reduced. Dissolve blue vitriol 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 it becomes insipid; make a saturated aqueous solution of sal. volat. amon.; mix as much of this precipitate with the filtered solution of the volatile salt as it will dissolve, which reserve for use. Mix of this six drops to every ounce of water for an injection.

In the aphthous ulcerations which occur on the inside of the lips and cheeks, a solution of the sulphate of copper is one of the most efficacious applications. A solution of from ten to fifteen grains of the vitriol in eight ounces of water, with a few ounces of honey, may be employed for this purpose. In that terrible affection of the gums and cheeks which occurs in children—namely, *cancrum oris infantum*, Dr. Coates, of this city, found a mixture composed of two drachms of sulphate of copper, one ounce of powdered cinchona, and four ounces of water, applied to the ulcer twice daily, more beneficial than any other application. In a case which recently came under my care, I employed this mixture with the happiest effect. Raemacher, (Hufeland's Journal, B. 62, p. 104,) asserts, that a saturated solution of the sulphate of copper in whisky, is one of the best means we possess for promoting the growth of hair. The scalp is to be washed with it twice daily.

Cuprum Ammoniacum.—Ammoniated copper.—This preparation consists of a triple salt; a subsulphate of the oxide of copper and ammonia. It has a metalline and exceedingly styptic taste, and an ammoniacal odor. It is soluble in the proportion of one scruple to an ounce of water.

This is one of the most powerful and valuable preparations of copper. Its powers are more strongly exerted on the nervous system than those of any of the other preparations of this metal, and it has accordingly been much employed in nervous and convulsive affections. When given in very large doses it is apt to cause vertigo, nausea, indistinctness of vision, vomiting, pains in

the bowels, obstinate constipation or diarrhœa; and when its use is long-continued, it may give rise to paralysis, hectic fever, violent spasmodic pains in the abdomen, spasms of the muscles, and even death. These violent effects, however, never follow its use, unless employed in very full doses; for, under cautious management, it may be given with as little risk of injury as any of the other more metallic tonics.

In no disease, perhaps, has this preparation been more celebrated as a remedy than in epilepsy. It was a favorite remedy, in this disease, with Dr. Cullen, and many of the most eminent physicians have published statements illustrative of its good effects in this malady. Among the writers who speak particularly in praise of its powers in epilepsy, we may mention Loebenstein-Lobel, Burserius, (Institut. Pract., vol. iii.;) Greding, Michaelis, (Med. Pr. Bibl., 1785, B. i.;) Stark, Van Hoven, J. Frank, (Prax. Med. Univ. Prac., p. ii. vol. i.;) and Richter, (Spec. Therap., B. vii.) Dr. Batt has more recently published an account of its valuable powers in this disease. He administered it in combination with valerian, to three individuals affected with epilepsy, and all were effectually cured by it. Hufeland asserts, that he cured a case of inveterate epilepsy, after a great variety of remedies had been ineffectually employed, by the use of a mixture composed of one-fourth of a grain of cuprum ammoniacum, three grains of the oxide of zinc, and one scruple of powdered valerian, taken mornings and evenings, at the same time that the patient took a strong infusion of the flowers of arnica, valerian, and orange-leaves during the day.

This article has also been recommended in other forms of spasmodic and nervous diseases; particularly, in chorea, catalepsy, and in spasmodic asthma. Odier asserts, that its powers in diseases of this kind, are much increased by uniting it with the oxide of zinc. B. Bell gave it with complete success in a case of spasmodic cough, attended with great irritability of the nervous system; and Walker* states, that he cured many cases of chorea with this remedy. He observes that he found it particularly useful where the disease was accompanied with much relaxation and debility. Willan, also, cured a case of chorea with this medicine.

In hysteric affections, attended with great irritability, anxiety, cramps, and feebleness, the cuprum ammoniacum is a remedy of very useful powers.

Thuessink, a German physician, has published some very interesting observations on the powers of this remedy in hysteria. He considers it particularly useful in those chronic cases which

* A Treatise on Nervous Diseases.

depend, or at least are accompanied with debility and relaxation, and a very irritable state of the system.*

I have myself employed this remedy in a considerable number of instances, in chronic hysteria, and occasionally with the happiest effect. I have usually given it in combination with valerian, in the proportion of a quarter of a grain of the ammoniated copper, with thirty grains of the valerian, twice daily. Particular attention, however, should at the same time be paid to the state of the bowels. If costiveness follow the use of this remedy, a mild laxative must be given from time to time, so as to keep up regular alvine evacuations. With regard to the powers of this preparation in epilepsy and similar affections, however, my own experience does not furnish me with any evidence of its particular usefulness, although I have employed it in no small number of cases of this kind. Recently, I prescribed it in an anomalous spasmodic affection, resembling, in some respects, catalepsy, with manifest advantage; but, in this instance, it was employed in conjunction with the oxide of zinc.

In the cure of obstinate intermittents, this remedy is highly spoken of by Brera; he thinks it quite equal to arsenic in this disease, especially where there is much irritability of the general system, and the intestinal canal is in a state of debility.†

A solution of this preparation is an excellent application to old and ill-conditioned ulcers, and has also been applied with much advantage to the removal of opacity of the cornea.

We may commence with it in the dose of a quarter of a grain twice a day, gradually increasing the quantity as far as the stomach will bear it. It is best given in the form of pills. It is sometimes given with sugar; but if it be true that this vegetable substance counteracts the operation of copper, such a combination would appear to be improper.

In general, the addition of a small dose of opium will be found useful, to obviate its unpleasant effects on the stomach and bowels; and this combination is especially proper where there is much gastric and general irritability present. Boerhaave, Cullen, and Richter, indeed, assert that opium enhances its powers as a remedy in spasmodic affections, independent of its mere tendency to enable the stomach to retain it with less inconvenience.

Boerhaave mentions a preparation made by digesting one drachm of copper filings in an ounce of aqua ammonia, which he represents as a very valuable diuretic, and as especially useful in some varieties of dropsy. The dose is three drops, gradually increased to twenty-four every morning.

* Samlung. Auserles. Abhandlung für Pract. Aerzte, vol. xvii. p. 266.

† Burdach's Arzneimittellehre, B. ii. p. 184.

Liquor cupri ammoniato-muriatici.—This preparation was first mentioned by Köchlin, (Med. Chir. Zeitung, 1818,) and appears to have, of late years, been a good deal employed by the German physicians. It is thus prepared:—Digest one drachm of copper filings in an ounce and a half of aq. ammonia nine or ten days; then saturate this tincture with muriatic acid. Two drachms of this saturated tincture are to be mixed with twenty ounces of distilled water. Of this, adults are to take a tablespoonful three times daily.* This preparation is said to be peculiarly valuable as a remedy in syphilitic ulcerations, as well as in scrofulous and other obstinate or corroding ulcers. It is asserted by some writers that, in males, this tincture has the effect of exciting the venereal propensity to a very considerable degree. The writers who speak particularly in praise of this preparation in syphilitic and scrofulous affections, besides Köchlin, are, Kopp (Beobacht. in Gebiete der Prack. Heilk., p. 330); Henn (Hufeland's Journal, Bd. 58); Schneider (Med. Prakt. Advesar., &c., 1822); Wolfe (Grafe and Walther's Journal, 1825); Jager (Harless, Rheim. Jahrb., B. 5).

Acetas cupri—Ærugo æris.—Verdigris.—This preparation was formerly a good deal employed as an *internal* remedy in certain chronic diseases, particularly in syphilis, scrofulous ulcerations, and other varieties of external ulcerative affections. At present, however, it appears to be entirely laid aside as an internal remedy. The celebrated nostrum of Gerbier consisted of a combination of verdigris, roasted barley, and calomel, formed into pills. These pills are said to be highly beneficial in scrofulous and cancerous affections. The French Academy of Medicine commissioned Solier de la Romilias to test the usefulness of this remedy in one of the Parisian hospitals; and his report states that, in general, its beneficial influence upon scrofulous or carcinomatous ulcerations of the mammæ were very considerable. He found it especially useful in *noli me tangere* of the nose. The verdigris is given in doses of an eighth of a grain three times daily, and gradually increased until it begins to give rise to

* Gölis recommends the following mode for preparing this tincture:

℞.—Cupr. ammoniac. ℥ss;
Solve in aqua fontana ℥iv;
Adde, acid. muriat. q. s. ut post coagulum viride liquor fiat pellucidus.

Mr. Buchner's method of preparing it is as follows:

℞.—Cupri oxydati carbon. gr. xlii. Solve in acidi muriat. q. s. donec omnis effervescentia desiderit; adde, ammonii muriat. dep. ℥ixss. Cum gr. vi. Aq. distil. q. s. ut fiat liquor ℥vi. Gölis's preparation is three times as strong as that of Köchlin.

nausea and other unpleasant sensations in the stomach, (Dict. des Scien. Méd., t. vii. p. 576.)

Schlegel (Material f. d. Staats Arneiw. 1809, 8te Samml. No. II.) has published a series of cases tending to illustrate the good effects of verdigris in syphilitic affections. He gave it in the following way.*

Externally, the acetate of copper is still frequently employed in certain cutaneous affections and ulcerations. Dr. Good recommends the following ointment as peculiarly efficacious in *porrigo* circinata.† Swediaur asserts that a saturated solution of verdigris in aqua ammonia, in the proportion of one drop to an ounce of water, forms one of the most effectual injections, for the cure of gleet, we possess. I have myself frequently employed this injection, and usually with complete success. It is much too active, however, for the acute stage of gonorrhœa. The *unguentum æruginis*, or *mel ægyptiacum*, as it was formerly called, forms an excellent application in foul, indolent, and chronic ulcerations, particularly where the granulations are luxurious and spongy. In ulcerations of the gums, internal surface of the cheeks, tonsils, and fauces, this preparation is said to be especially beneficial. It may be applied to the ulcers by means of a fine pencil. There are various formulæ for preparing the *mel ægyptiacum;* but that given in the London Pharmacopœia appears to me the best. Swediaur recommends a liniment made of verdigris, composed of four grains of this preparation rubbed up with an ounce of sweet oil, as a very valuable application to atonic and callous chancres and venereal ulcerations with indurated edges, and weak and spongy granulations.

A preparation of verdigris is mentioned by Hufeland, under the name of *æther cuprius*, which he represents as a peculiarly useful remedy in spasmodic and convulsive nervous affections. It is made according to the following formula.‡ The dose of this preparation is from three to ten drops three times daily. (Richter's Arzneimittell. Bd. iv. p. 486.)

* R.—Ærugo æris crystall.		gr. ii;
Solve exacte in aceti concentr.		℈ii;
Admisce camph.		gr. iv;
Opii		gr. ii;
Sacch. alb.		ʒss;
Micæ panis		q. s. ut fiat pil. No. 40.

Take from five to ten every morning, noon and evening.

† R.—Cerat. resinæ ℈i in balneo aquosa liquifactæ; adde, terebinth. vulgar. ʒss; tunc cupri acetas, calomel, āā ʒi; insperge, et omnia misce.

‡ Æruginis ʒi; solve in acidi muriat. q. s.; adde, Acidi nitrici, sext. partem acidi muriatici. Solutio ad siccitatem evaporetur, tum seponatur, donec attracto humido et ære liquescat. Liquamen solve in triplo ætheris sulphurici.

The *aqua viridis Hartmanni* is another preparation of this article which was formerly much used as an external application to foul, indolent, or fungous ulcerations. Baldinger asserts that it generally does a great deal of good when applied to the painful ulcerative inflammation which occurs at the roots of the nails, and causes their separation. (N. Magazin. f. Aerzte. Bd. iii.) This preparation consists of a mixture of two drachms of verdigris, the same quantity of alum, half an ounce of honey, and one pint of white French wine.

ZINC.

Oxide of Zinc.—Flowers of Zinc.—The prepared oxide of zinc consists of an inodorous, tasteless white powder, insoluble in water, alcohol, and the solutions of the carbonated fixed alkalies, but readily dissolved by acids, and when recently prepared and still moist, in the caustic fixed alkalies, and both in pure and carbonated ammonia. Heat neither volatilizes nor decomposes it, and fuses with great difficulty. "It is sometimes adulterated with white lead or chalk. If it contains either, it will not be entirely soluble in dilute sulphuric acid, but an insoluble sulphate of lead or of lime will remain behind." Its neutral solutions in acids, when perfectly pure, form a white precipitate with the ferrocyanate of potassa, and with sulphuretted hydrogen.

This preparation was first introduced to the notice of the profession by Gaubius (*Adversaria Varii Argument.*). He obtained his knowledge of its remedial powers from a celebrated quack, who employed it with much success, as a nostrum, under the name of *luna fixata.* Since that time it has been much used in certain nervous and spasmodic affections, and its usefulness, in diseases of this kind, is attested by the general experience of the profession. As a general tonic, in relation to the muscular system and the digestive organs, it possesses but feeble powers. Its operation appears to be chiefly directed and confined to the nervous system; manifesting decided antispasmodic and roborant powers, with regard to this system.

In small or ordinary doses, the oxide of zinc produces no immediate perceptible effect on the system. When given in very large portions, however, its action is often violent, giving rise to vomiting, spasms of the stomach, constipation or diarrhœa, inflammation of the bowels, convulsions, and paralysis. Nevertheless, it rarely produces such violent effects, unless it be taken in enormous portions, and there is, therefore, nothing to be apprehended from its regular and proper administration. Gaubius, who first employed it in regular practice, gave it in epilepsy; and

the records of medicine, since his time, contain numerous statements illustrative of its valuable powers in this affection. Goodsir, Percival, Home, Bell, Osiander, Rush, Barcet,* Crell, Hufeland, and other physicians, have reported cases, demonstrating the powers of this medicine in epilepsy. Hufeland gave it in combination with cuprum ammoniacum, extract of hyoscyamus, and valerian. It appears to be more particularly useful in this disease when it affects children. Burdach observes, that it probably does more good in children by neutralizing acid in the stomach, and destroying worms.

In a case of this disease in a child, I gave this remedy in large and frequent doses, and in the course of two months succeeded in putting a permanent stop to the disease. Dr. Rush states that he cured a case of ten years' standing with the flowers of zinc. When prescribed for affections of this kind, it should be given in as large doses as the stomach will bear. Commencing with a grain three times daily, the dose may be gradually increased to twenty or even thirty grains thrice a day, in adults. In general, the quantity prescribed at a dose is much too small to procure any permanent advantage in such affections.

Shearman (Lond. Med. and Phys. Jour., Sept. 1822) gave it in scruple doses, twice daily, and gradually increased, in some instances, to one drachm. The medicine was "thus given for four days; an active purge was then administered, and on the following day the use of the zinc was resumed as before. By this mode of employing the oxide of zinc, he declares that he has, in a considerable number of instances, succeeded in curing epilepsy.

It has also been employed against hooping-cough. Hagen and Leoffler recommend it highly in this singular disease.

The flowers of zinc are a remedy of considerable value, in hysteric affections, connected with much relaxation and weakness. In cases of this kind I have sometimes employed it with Peruvian bark, and in several instances with very considerable advantage. Within the last two years, I have in several instances of chronic hysteria, employed the oxide of zinc in union with castor, or the tincture of belladonna, with the happiest effect. Two grains of zinc, with five grains of castor made into pills, or with twenty-five or thirty drops of the T. belladonna may be taken thrice daily.

This remedy has likewise been employed with very good effects in spasmodic diseases arising from the suppression of chronic cutaneous eruptions. Robœl used it in children affected with symptoms of chorea in consequence of the suppression of

* Mémoires sur les Causes des Convulsions chez les Enfans, &c. Paris, 1827.

eruptions on the head, and he states that the result was entirely favorable; the eruption returned after using the remedy for some days, and the disease disappeared.*

Its powers as a remedy in chorea, have, indeed, been much extolled by many writers of great authority. Burserius, (Institut., vol. iii.,) Van Hoven, (Handbuch, Bd. ii. cap. 14,) Hufeland, (Journal, B. xxvi. st. iii. p. 74,) Richter, (Med. Chir. Observat., p. 105,) Alexander, (Duncan's Annals, 1801, p. 303,) Thileniuc, (Med. Chir. Bemerk, Bd. i.,) Wright, (Memoirs of the Med. Society of Lond.,) Brent, and many other celebrated physicians, have reported cases of this disease, which yielded to the oxide of zinc, after various other remedies had been ineffectually used.

This preparation has also been successfully employed in spasmodic asthma. Wolff has related a remarkable case, which yielded completely to this remedy (Hufeland's Jour. Bd. xviii. st. i. p. 53), and Jahn (Mat. Med. Bd. ii.), asserts that he has often derived great benefit from its employment in affections of this kind.

According to the experience of Hufeland, the oxide of zinc is a remedy of great value in the eruptive stage of small-pox, when the eruption is slow and imperfect in its progress, or is interrupted before it is fully completed, and attended with nervous and convulsive symptoms. He says, that in such cases this medicine allays the muscular twitching, delirium, and febrile irritation, and often speedily improves every symptom of the disease. To children of from one to three years old, he gave two grains of the oxide every two hours. Sprengle, also, speaks very favorably of this practice, and observes, that he found it especially useful to promote the regular suppuration of the pustules, where this process went on imperfectly. Thuessink (Hufeland's Jour. Bd. vi. p. 672), employed this article with marked benefit in an epidemic small-pox, attended with prominent catarrhal symptoms. Hufeland states that in some instances, where violent symptoms ensued the retrocession of measles, he has derived great advantage from the free employment of this remedy; and Richter expresses a favorable opinion of its powers in cases of this kind.†

Externally, the oxide of zinc admits of various useful applications. Hufeland recommends an ointment, made by mixing half a drachm of the oxide of zinc, with an ounce of spermaceti ointment, as peculiarly beneficial in painful excoriations and ulcers of the nipples. It is also one of the most effectual applications we possess, in obstinate *herpetic* ulcerations, and in other eruptions

* Burdach's Arzneimittellehre, B. ii. p. 197.

† Specielle Arzneimittellehre, B. iv. p. 508.

of a scabby and ulcerative character. Greiner (Richter, Spec. Arzneimitt.), asserts, that we possess no remedy superior to this ointment in ulcerations of this kind. He succeeded in curing an ulcer on the nose, simply by the application of this ointment, after it had for eight years resisted various modes of treatment. Bateman mentions it as an excellent application in *porrigo furfurans*. In herpes of every variety it will often do much good. Wetzler states that he cured cases of this kind after various other approved remedies had been ineffectually employed. Crusta lactea, also, has been successfully treated by this ointment; and Thuessink states that he has derived great benefit from the application of the oxide of zinc,* mixed with powdered starch, in erysipelatous inflammation. Somme (Archives Générales de Méd., t. i. 1823), strongly recommends injections composed of half an ounce of this preparation and two pints of water in *fluor albus*. He declares that he has succeeded in putting a permanent stop to the disease by this remedy in the course of three or four days. In ophthalmia, the oxide of zinc in the form of ointment, has been much used. Plenk recommends a lotion consisting of a drachm of this preparation, and six ounces of water; or an ointment made by mixing one scruple of it, with an ounce of fresh unsalted butter, applied to the edges of the eyelids. In pruriginous ophthalmia, an ointment composed of half a drachm of the zinc, one ounce of lard, and four grains of opium, will often procure speedy relief.

Sulphas zinci.—White vitriol.—The sulphate of zinc is a remedy of very considerable powers, and has been much employed in spasmodic and other diseases. Under the head of Emetics, I have already spoken of the remedial application of this substance, so far as its emetic properties are concerned, and it remains for me, therefore, in this place, only to notice its virtues as a tonic.

In the cure of epilepsy, many practitioners have thought it preferable to the preceding preparation, and I am inclined to believe that this opinion is well founded. Cullen gave it in this disease with advantage, and Johnston† states that he cured several cases with it.

Chorea, also, has been successfully treated with this article. Two instances of this disease, which appear to have been of a

* "Dr. Roloff, of Magdeburg, has lately discovered the casual presence of arsenic in the oxide of zinc; by boiling the substance in distilled water, and assaying the solution with ammoniaco-nitrate of silver, its presence may be instantly recognized; chalk may be detected by sulphuric acid exciting an effervescence; and white lead, by forming an insoluble sulphate of lead. It ought to be volatile."—*Paris's Pharmacologia.*

† Medical Essays and Observations.

very obstinate character, were cured by the sulphate of zinc in the Berlin Polyclinic Institute (Hufeland's Journal, B. 57). The dose was gradually increased from half a grain, twice daily, to seven grains. Müller used it with success in this disease.

In chronic hysteria, or general debility, attended with great nervous irritability, the use of this tonic is sometimes peculiarly beneficial. In cases of this kind, I have prescribed half a grain of the sulphate, with the same quantity of ipecacuanha, to be taken three times daily, with highly favorable results.

Lettsom and Crell employed this article with success in habitual palpitations of the heart. Asthma has also been successfully treated with this preparation (Sundelin); and Meglin (Journal de Med., par Corvisart), cured neuralgia of the face, and hemicrania, with it. Paris says, that sulphate of zinc, in union with camphor and myrrh, is an excellent remedy in spasmodic cough (Pharmacologia); and Brand mentions it as often particularly serviceable in hooping-cough; Schwartz also states that he has given it with marked benefit in this affection.

In hysteria, Dr. Lettsom employed this article in conjunction with quassia, and the result, according to his account, was favorable.

Dr. Hewson, of this city, has lately informed me that he has been particularly successful in curing intermittents with this remedy. Dr. S. Firth, in a letter to Dr. S. Mitchell, dated Calcutta, 1805, speaks in very high terms of this practice. "The sulphate of zinc," says he, "is a remedy which I have been in the habit of prescribing in several diseases as a tonic, and am of opinion, that when combined with a narcotic anodyne, it may be substituted very advantageously for the cinchona officinalis. I have often done this in practice, and was seldom disappointed in its good effects."

Brande, too, speaks in the most favorable terms of the article, as a remedy for intermittent fever. He thinks it quite equal to arsenic in this respect. He gives it according to the formulæ below.* I have, myself, frequently prescribed this remedy in

* ℞.—Sulphat. zinci gr. ii;
Aq. cinnamom. ℥iiss;
Aq. distillat. ℥ii;
Tinct. colombæ ℥i.—M. Dose, three tablespoonfuls every three or four hours: or

℞.—Sulphat. zinci gr. iv;
Decoct. cinchonæ ℥xv;
Tinct. gentian. compos. ʒiv.—M. This is to be divided into eight doses, one of which is to be taken every three or four hours.

intermittents, and almost uniformly with complete success; I have usually directed it in the form of pills. One grain of the sulphate with three grains of powdered capsicum made into pills, should be taken every two hours during the intermission, until eight or ten doses are taken.

"In remittent fevers, it is a useful and valuable remedy, and can be given when the bark is inadmissible, especially if combined with the extract of hyoscyamus niger. In the remittent form of the malignant fever of Asia, I have given it to the extent of three grains of the hyoscyamus niger, and four of vitriolum album, every hour and a half. I formerly used this remedy with much success." He continues: "In a number of cases of intermittent fever, in Pennsylvania, when I resided at the Philadelphia Dispensary, I had frequently an opportunity of comparing its virtues in the cure of intermittent fever, with bark and arsenic; the result of my experience was, that in many cases it cured where the bark failed; but I found, also, that the bark succeeded in as many cases where the vit. alb. had disappointed me."

I have used the sulphate of zinc with great benefit in chronic rheumatism arising from the long-continued and incautious use of mercury. In one instance, the relief obtained was complete and permanent, after a great variety of other approved remedies had been used, for many months, with little or no advantage. From what I have observed of its effects in this respect, I am inclined to regard it as a valuable remedy in affections of this kind. I have used it in one instance of syphilitic rheumatism, with marked advantage. I gave it in combination with the extract of cicuta, in the proportion of one grain of the former, to two grains of the latter. Weil and Crell recommend this article in chronic arthritis. The dose of this medicine, when employed as a tonic, is from one grain to two or three. It is most conveniently given in the form of pills.

For an account of the external use of this remedy, the reader is referred to the article sulphate of zinc, in the chapter on Astringents.

Acetate of Zinc.—From the experience of Orfila, Deveaux and Dejaer, it appears that this preparation may be taken into the stomach in considerable quantities, without causing any poisonous or injurious consequences. Henry was the first who employed the acetate as a remedial agent. He recommends it strongly, as an injection in gonorrhœa, and other writers have since expressed opinions equally favorable to its employment in this disease. (Med. Phys. Jour., 1803.) Internally it may be given in doses of from six to fifteen grains; and its powers appear to correspond with those of the oxide and sulphate. Rademacher (Hufeland's Jour., Bd. 62) recommends it in maniacal affections. He affirms

that he has known it to produce the happiest effect in cases of this kind. He gave it to the extent of a drachm and a half in twenty-four hours. Dr. Dewees recommends this preparation in the proportion of two grains to four ounces of water as an excellent lotion in the purulent ophthalmia of infants. I have used it with much benefit in this affection.

Muriate of Zinc.—The muriate of zinc speedily deliquesces when exposed to the air—forming what has been called the butter of zinc (*butyrum zinci*). Hufeland recommends a solution of this preparation in sulphuric æther, in the proportion of one part of the dry muriate to eight parts of the æther, as a very excellent remedy in the nervous affections which have already been mentioned as often susceptible of being cured by the oxide of this metal. Hancke (Rust's Magazin., vol. xxii. s. 377) strongly recommends this preparation of zinc for the cure of epilepsy. He says that, when the disease arises from a disordered condition of the abdominal viscera or of the spinal marrow, the happiest effects may be expected from this remedy. He directs that two grains of this preparation be dissolved in two drachms of "*spirit muriatico-æthereus*," and given, at first, in doses of four or five drops every four hours, and gradually increased to ten drops. He declares, also, that he has succeeded in curing several cases of *chorea* with this remedy, after a variety of the most approved means and modes of treatment had been ineffectually resorted to. In the Charité, at Berlin, this solution was used with much success in chronic pains in the bones and joints. (Hufeland's Journ., Bd. xxx, St. xxx, p. 15.) The muriate of zinc has, however, been most commonly employed as an external remedy. It is said to be a peculiarly valuable escharotic, producing little or no pain, or general irritation, although sufficiently active, in this respect, for all the purposes of an escharotic. Several German writers prefer it to all other articles of this kind we possess, in old atonic, fungous, or indurated ulcerations. Two grains of the muriate dissolved in an ounce of water may be applied by means of a dossil of lint, to indolent and fungous ulcers. In old and indolent syphilitic ulcerations, it is said to be especially beneficial. When its escharotic effects are desired, the muriate may be sprinkled or applied in a layer over the part. Hancke asserts that in cancerous ulcers, he has known this application to prove more effectual than the usual arsenical pastes. Applied over the whole ulcer, about a line in thickness, it will in general destroy the diseased parts in the course of eight or ten hours, with but very little pain, and without exciting much inflammation in the surrounding parts. In every affection, in short, where an escharotic may be deemed proper, this article, it is said, may be used with as much, if not more advantage, and with less suffering, than

any other application of this kind. Internally, this dose of the muriate is from one-eighth to one-fourth of a grain. Hufeland's *ætherial solution* may be given in doses of from five to ten drops, three times daily.* It should, however, always be given with caution, for in over-doses it has been known to produce pain in the stomach, nausea, retching, a feeling of distress in the region of the heart, short and anxious respiration, a small and rapid pulse, cold sweat, syncope, and spasms.

Hydrocyanate of Zinc.—This preparation of zinc has not yet been introduced into any Pharmacopœia. According to the experience of Hufeland, (Hufeland's Journ., vol. l. No. iii. p. 106,) and of Henning, (Ibid., vol. lvi. No. vi. p. 80,) however, it highly merits the attention of the profession, as a remedy in certain spasmodic and nervous affections. In gastrodynia and spasmodic affections of the stomach, the former of these eminent physicians declares he has found it a most valuable medicine. He commenced by giving one grain three times daily, and gradually increased the dose to four grains. Henning employed this preparation in chronic hysteric affections, in the epilepsy of children during dentition, and in spasms of the stomach, with decided advantage. In the Berlin Clinic Institute, two cases of obstinate chorea were cured with this remedy, though not until its use had been continued a long time and in large doses. (Hufeland's Journ., Bd. lvii. No. vi. p. 56.) In these two cases the dose was gradually increased from one-third to seven grains, given twice daily.†

BISMUTHI SUBNITRAS.—*Olim* OXIDUM BISMUTHI.

Magistery of Bismuth.—This is the only preparation of bismuth employed for medicinal purposes. It consists of a white, inodorous and insipid powder, sparingly soluble in water, and in the solutions of the fixed alkalies. In ammonia it dissolves more readily. When exposed to the light, or to the action of hydrosulphuric acid, it acquires a dark and almost black color; requiring, hence, to be kept in well stopped bottles, and in a dark place, in order to preserve its white color, and prevent any change in its composition.

It is not more than twenty-eight years since this remedy was introduced into practice by Dr. Odier,‡ of Geneva, and Delaroche, of Paris. Its remedial virtues had, however, been parti-

* Richter's Spec. Arzneimittell., Bd. iv. p. 535.

† Ibid., p. 523.

‡ Journal de Médecine, 1786, tom. lxviii. p. 49.

cularly noticed by Jacobi,* nearly a century before Dr. Odier published his observations on its employment; but it does not appear that it had attracted the attention of the profession anterior to the publication of Dr. Odier's paper.

The medicinal powers of this article do not differ very materially from those of the oxide of zinc. Given in inordinate doses, it is apt to give rise to nausea, a sense of constriction in the epigastrium, anxiety, vomiting, giddiness, prostration, and a small and weak pulse. The diseases in which it has been particularly recommended, are, gastrodynia, spasms of the stomach, hysteric colics, pyrosis, and other dyspeptic complaints. The testimony of Dr. Marcet, Drs. Bardsley and Clark, in England; of Hufeland, Reil, Krysig, Belsen, &c., in Germany, and of Dr. Hosack and Moore, in this country, is strongly in favor of the remedial powers of this article, in this disease.

At present its employment is chiefly confined to the cure of gastrodynia, pyrosis, and cardialgia. In these affections it seems to be pretty generally admitted to be a medicine of much value. Dr. Marcet, whose testimony deserves great respect, in a paper read in 1801, before the London Medical Society, says, "I have since had frequent opportunities, at Guy's Hospital, of trying the oxide of bismuth in spasmodic affections of the stomach, and those trials have fully confirmed the opinion which I formerly gave of the utility of this medicine." Dr. Samuel W. Moore, of New York, in his excellent dissertation on the medical virtues of the white oxide of bismuth, relates three cases of painful affections of the stomach, in which this remedy was employed with much success. I have employed it in several cases of spasmodic pain of the stomach, and in two its effects were decidedly beneficial; though in the others, which appeared to me perfect cases of gastrodynia, it had not the slightest effect whatever. Upon the whole, however, the evidence we have in favor of the powers of this remedy, in the diseases mentioned, entitles it to much attention from the profession. This remedy has also been used with advantage in dysmenorrhœa. Durr states that he has used it in this affection, in combination with castor and belladonna, with marked success. Robertson says that he used this article with great benefit in a case of protracted salivation.

It is said that this article is particularly efficacious in neuralgic pains of the stomach, when administered in combination with belladonna. In cardialgia it may be very advantageously given in union with calcined magnesia. (Hufeland's Journ., vol. xlvi. No. ii. p. 9.)

Carminati (Opusc. Therap., vol. i.) asserts that he has not only

* L. F. Jacobi de Bismutho. Erford, 1697, 4 Burdach.

found this article highly beneficial in gastrodynia, but also in debility with morbid sensibility of the stomach; and Bardsley and Yates strongly recommend it as a tonic in dyspepsia, attended with spasmodic pains* and increased sensibility of the stomach. It has also been employed with success in violent and spasmodic vomiting. (Kopp.) According to the experience of Durr, a German writer of considerable reputation, the oxide of bismuth is an excellent remedy in dysmenorrhœa. He gave two grains, in combination with a grain of the extract of belladonna and half a grain of calomel, every three hours.† Epilepsy, also, has been successfully treated with this remedy. Loebenstein-Loebel says that it is most apt to prove advantageous in those cases of epilepsy which arise from gastric irritation. He gave it in union with the essential oil of valerian.

This medicine may be given in the dose of from two to ten grains three or four times a day. Hufeland says that its virtues are increased by being given in combination with the extract of hyoscyamus and ol. cajeput. Odier gave it a quarter of an hour before eating, and to the extent of twelve grains for a dose.

Externally, the oxide of bismuth has been much used by females as a *cosmetic*, that is, for the purpose of beautifying and improving the complexion. In the form of ointment it is said to be a very efficient remedy in herpetic and other chronic cutaneous affections. Mixed with lard, in the proportion of one part of the oxide to three of the lard, it has been used with prompt success, in the itch. (Schroder, Richter.) Odier and Hahnemann assert that toothache will often speedily subside by taking a portion of the oxide of bismuth into the mouth.‡ I do not know a better application to excoriated and tender nipples than an ointment composed by mixing a drachm of this article with an ounce of fresh lard.

ARGENTUM.

Metallic Silver.—It has been asserted that silver, in its metallic state, taken into the stomach, produces tonic and alterative effects on the system. Meyer affirms that he has used the filings of silver with the happiest effects in obstinate intermitting fevers. He states that a single dose of fifteen grains, taken just before the accession of the paroxysm, was in general sufficient to arrest the disease. (Hufeland's Journ., Bd. lxiv.) Richter, however, thinks that the effects ascribed to the silver by Meyer, depended on the

* London Quarterly Journal, vol. viii. p. 295.

† Hufeland's Journal, Bd. lvi. St. v. p. 48.

‡ Voigtel's Arzneimittell., 2 Abth. Bd. iii. p. 436. Richter's Arzneimittell.

small portion of copper with which this metal is usually alloyed, and this opinion is not at all improbable.

Nitrate of Silver.—The nitrate of silver, when fused and cast into small cylindrical pieces, forms the lunar caustic of the shops. These pieces are of a dark gray color, and break with a shining crystaline fracture. The lunar caustic possesses no odor, but it has an exceedingly austere, bitter, and metalline taste. It is soluble in an equal weight of water at 60°; it also dissolves in alcohol.

In another place I shall have occasion to speak of the employment of this substance as an escharotic; in the present place, therefore, I have only to notice its remedial powers as a tonic and alterative.

The nitrate of silver holds a high rank among our remedial agents. As a remedy for *epilepsy*, its reputation is equal, if not superior, to that of any other article of the materia medica. We find it mentioned by Paracelsus and Stahl, as possessing highly useful powers in this respect. Dr. Sims, of London, relates several cases in which this remedy was successfully employed.* Dr. Cappe,† also, speaks well of the powers of this medicine in epilepsy. Nord, a German writer, gives an account of a case of epilepsy complicated with mania, in which the nitrate of silver was employed with complete success.‡ It has also been successfully used in this disease by Dr. Gough,§ Sir Henry Halford,‖ and Dr. Roget.¶ Sementini, an Italian physician, declares it is more efficacious in this disease than any other remedy we possess. It ought to be given, he says, in combination with a vegetable extract. This writer states, also, that he found it successful in paralysis.** He says that a cutaneous eruption, of a pustular kind, frequently appears in those who are taking this remedy; and that when this takes place, we may be assured of the beneficial influence of the medicine. Loebenstein-Loebel (Wesen. und Heil. et Epilepsie, p. 243) recommends the following combination as peculiarly valuable in this affection, when the digestive powers are not particularly impaired.†† Other names

* Mem. of the Med. Society of London, vol. iv. p. 379.

† Arzneimittellehre, Bd. iv. p. 419.

‡ Medicinische National Zeitung, 1798. Sup. No. xiii. s. 206.

§ Medical Museum, by Dr. J. R. Coxe, vol. iii. p. 70.

‖ Medico-Chirurgical Transactions, vol. ix. p. 236.

¶ Ibid., vol. vii.

** Giornale di Fiscia, tom. xi. p. 355.

†† ℞.—Nitrat. argenti gr. x;
Extract. cicutæ ℈i;
Extract. valerian. ʒi.—M. Divide into one grain pills. Take three every morning and evening.

might be added in testimony of the efficacy of this medicine in epileptic complaints. Many practitioners, however, who have prescribed this remedy in the present disease, have been entirely disappointed. In my own practice, it has but very seldom produced any decided advantages, although I have given it largely and perseveringly in several instances. Nevertheless, the successful instances treated with this remedy are so numerous, and so well attested, that no doubt can be entertained of its especial efficacy in the symptomatic forms of the disease. Since the second edition of this work has been published, I have witnessed its successful employment, in a well marked and obstinate case of this disease.

The nitrate of silver has also been used with advantage in other convulsive affections. Wolf speaks very favorably of it as a remedy for tremors and sympathetic palpitations of the heart; and Dr. Powel, of London, has published cases of its successful use in chorea.* It has also been employed with marked success in this singular spasmodic affection by Dr. Franklyn, (Med. and Phys. Journ., April, 1815,) and by Dr. Bruce, (Med. Chir. Transact., 1818, vol. i. p. 1.) Pitschaft declares that the nitrate of silver is one of the most valuable, if not the best remedy we possess for chorea. (Hufeland's Journ., vol. li. No. iii. p. 54.) Priou states that he cured two cases, which had previously resisted a long course of judicious treatment, by a combination of the nitrate of silver, opium, musk, and camphor. (Jour. Générale de Méd., vol. lxxxvii. p. 299.)

This remedy has likewise been employed with success in angina pectoris, dropsy, and leucorrhœa. "In several instances of leucorrhœa," says Dr. Thacher, "the nitrate of silver has been employed in doses of one-twelfth of a grain three times a day, with complete success." Bayle and Geoffroy speak favorably of its effects in dropsy.

In combination with cicuta, I have, in a few instances, prescribed this article with excellent effect in scrofulous ulcerations. In old constitutional ulcers, the nitrate of silver, administered in doses of from gr. i to vi three times a day, has been known to prove highly beneficial. I once prescribed it with complete success in an alarming case of ulceration of the gums and jaws, from the imprudent use of mercury. A part of the palate and upper jaw, with the two middle incisors, had already come away, and the ulceration was spreading rapidly. I administered the fourth of a grain of the nitrate of silver, three times a day, and by this remedy alone, succeeded without difficulty in arresting the disease. This preparation is, indeed, highly recommended by Hahnemann, in the treatment of mercurial diseases.

* Med. Transact. of the College of Phys. of Lond., vol. iv. 1813, p. 85.

Dr. Roberts, an English writer, employed it with much benefit in counteracting the deleterious effects of lead.

I have employed this article with great advantage in aphtha, and in chronic inflammation of the mucous membrane of the stomach and bowels. In these affections, it should be given in a liquid form, and in very small doses. The one-eighth or one-sixth of a grain, dissolved in a mucilaginous fluid, may be given every four hours.

The nitrate of silver may be given from one-fourth of a grain to six grains; gradually increasing the dose. Nord began with half a grain, and gradually augmented the dose to fifteen grains, three times a day. I have frequently given it to the extent of six grains.

It is now ascertained beyond a doubt, that the long-continued use of nitrate of silver is capable of giving a permanent black color to the skin. The late Dr. Albers, of Bremen, relates several cases of this kind.* A case, also, is reported by Dr. F. Harrold, of England, in which the skin became nearly black in consequence of the internal use of this remedy;† and Sir H. Halford gives an account of a person who took it for a year and a half, and whose skin, at last, assumed a permanent dark hue.‡

The incompatible substances are, "fixed alkalies and alkaline earths; the muriatic, sulphuric, and tartaric acids, and all the salts which contain them; soaps, arsenic, hydro-sulphurets, astringent vegetable infusions, undistilled waters." It does not deliquesce when free from copper.

For an account of the employment of this article as an external remedy, see the article *lunar caustic*, in the chapter on Escharotics.

Formulæ.

℞.—Argenti nitrat. gr. xii;
G. opii gr. x;
Extract. gentian. ʒi.—M. Divide into sixty pills. Take three pills twice daily—gradually increasing the dose according to circumstances.

Liquor argenti muriatico-ammoniati.—Kopp has given the following directions for making this preparation, which he asserts to be, in many respects, decidedly superior to the nitrate—more especially in epilepsy. Dissolve ten grains of lunar caustic in two ounces of distilled water; filter, and add a sufficient quantity of muriate of soda dissolved in water, to precipitate the solution. The precipitate is to be carefully washed, and dissolved in ʒiss

* Vide Eclectic Repertory, April, 1816.
† London Med. Repository, vol. v. May, 1817.
‡ Medico-Chirurg. Transact., vol. ix. p. 237.

of caustic aq. ammon. Then add to this solution ʒiii of muriatic acid. The dose for a child from five to ten years old, is three drops, in a tablespoonful of water, three times daily. During the use of this preparation, all acids and acescent articles of food should be avoided.

AURUM.—GOLD.

During the ages of alchemy, gold enjoyed considerable reputation as a medicine. It had, however, sunk into entire neglect, when Dr. Chrestien,* in 1811, published his observations concerning its remedial powers, and again brought it to the attention of the profession. This writer adduces a number of facts illustrative of its efficacy in syphilitic and scrofulous cases; and asserts that the employment of gold is not liable to the same inconvenience which occasionally attends the use of mercury. It cures the disease without exciting ptyalism; and unless given in too large doses, produces no sensible disturbance in the system. No particular care as to regimen is required during its employment, and the patient, we are told, may go about his ordinary business; nay, it is even stated that the remedial employment of gold admits of a generous diet, and the moderate enjoyment of wine. The preparations which he used are: metallic gold in the state of minute division; oxide of gold, precipitated by potash; the oxide precipitated by tin; and the triple muriate of gold and soda. Of these preparations, the muriates are vastly more powerful than the oxides and divided gold. The latter is the weakest of them all. Orfila ranks the muriate of gold among the poisonous substances; and Chrestien asserts that it is incomparably stronger than corrosive sublimate. He administered it in doses at first no larger than one-fifteenth of a grain, and if pushed beyond one-tenth of a grain, it never failed to excite fever and inflammatory symptoms. The oxide he gave in doses of from half a grain to two grains, and the metallic gold to the extent of three grains daily.

Duportal, who, in conjunction with Pelletier, published a very interesting memoir on the preparations of gold, adds his testimony in favor of the efficacy of this remedy in syphilitic complaints. He relates a remarkable instance of the good effects of these preparations in a cancerous ulcer, "that had destroyed the upper lip, attacked the soft parts of the nose and left cheek, destroyed the square bones; and rendered the maxillary bone carious." Not-

* Observations sur un Nouveau Remède dans le Traitement des Maladies Vénériennes et Lymphatiques, par A. Chrestien, à Paris, 1811.

withstanding the very high terms in which the auriferous preparations have been spoken of by Drs. Chrestien, Duportal, Plenciz, and others, it does not appear that they are much attended to at present in the treatment of any diseases. Pontin, and several other Swedish physicians, who have tried this remedy, state that they never obtained any real advantages from its use.

In this country the reports of several eminent practitioners have not been very favorable in relation to the power of this remedy in scrofulous and syphilitic diseases. Dr. Hosack and Dr. Francis saw several cases in which the syphilitic symptoms returned after they had disappeared under the use of the gold. It ought to be observed, however, that this is not unfrequently the case even with the acknowledged specific, mercury, when too soon discontinued, or improperly used. It would appear, also, from the experience of these and other physicians, that the muriate of gold is of doubtful efficacy in the secondary symptoms of this disease.* To this, however, we may oppose the evidence of Dr. Samuel L. Mitchell, who, in a communication to Dr. Dyckman, says, "the efficacy of this medicine has been tried year after year in the New York Hospital. My practice with it there has been witnessed by all the attendants of the wards. It possesses admirable virtues against syphilis. Without presuming to affirm that it is capable of eradicating the distemper in every instance, my opinion, upon the whole, is, that the muriate of gold will effect all that is achieved by muriate of quicksilver, with incomparably less inconvenience to the patient. He gets well under the operation of the former without the hazard of a sore mouth or a salivation, and with very little wear and tear of constitution. I consider the introduction of this preparation into common use as one of the greatest improvements in modern medicine; and I wish it were already as universal as the malady it is intended to remove. The muriate of gold is found to increase the quantity of urine, in many instances, to such a degree, that it ought to be ranked among the diuretics of the materia medica."†

I have employed the gold in two cases of secondary syphilitic ulcers of long standing; in one of these there was evident amendment in the appearance of the ulcers, but I could not succeed in curing them by this remedy; the other case yielded to its powers, and the patient has since remained perfectly well. In both cases I had previously employed mercury for a long time, but without any good effects whatever. I have also administered it in a case of scrofulous ulcerations, and succeeded very soon in healing up the sores. The cure was not, however, permanent. In a recent memoir on the remedial properties of gold, by Dr. J. C. Niel, a

* Dyckman's Dispensatory, p. 201. † Ibid.

French physician, it is asserted "that the aurific preparations are exceedingly efficacious in tinea, elephantiasis and scrofula." This writer states, that the preparations of gold sometimes excite salivation; which, however, is not attended by the unpleasant effects that arise from a mercurial salivation. It seldom produces much inflammation of the mouth, and does not affect the teeth, nor is it attended with a fetid breath.*

From what has already been published in relation to this remedy, it is sufficiently evident that it possesses very important powers. We, however, want much more ample experience upon this subject before we can decide upon its real merits, and the particular cases to which it may be especially adapted.

Dr. Chrestien administered the different preparations of this metal by friction on the gums. It may, however, be more efficaciously used internally, either enveloped in some mucilaginous liquid, or in the form of pills. The pure muriate cannot be well given in this latter way, as it is much too caustic and deliquescent. For this purpose the triple muriate of gold and soda must be employed. This may be given from one-fifteenth to one-eighth of a grain, gradually increasing the dose. According to M. Figue the pure muriate may be conveniently given in the following mode: dissolve sixteen grains of the salt in one ounce of water; preserve this solution in a vial well closed, and seclude it from the light. Half a drachm of this may be made into pills, with starch or the crumbs of bread; or by being mixed with a sufficient quantity of some mucilaginous fluid to obtund its acrimony, it may be taken in a liquid form. The oxide is given in much larger doses. Dr. Chrestien gave it from half a grain to two grains. Other practitioners have, however, given it to a much greater extent. Van Mons administered from twenty to twenty-five grains. The report of this physician is much in favor of the efficacy of this preparation. He found it particularly efficacious in curing chancre.†

ARSENICUM.—ARSENIC.

Arsenic is a hard gray-colored metal, of a granular texture, and great brittleness. In its metallic state it does not affect the animal economy. Combined, however, with a certain portion of oxygen, it forms the white oxide of arsenic, or arsenious acid of the shops—the most active mineral poison with which we are acquainted. The oxide of arsenic is generally found in the form

* London Med. and Phys. Journ., vol. xlvii. p. 248.

† Burdach, Arzneimitellehre, vol. ii. p. 208.

of white semivitreous lumps, exhibiting, when pulverized, the appearance of white sugar. When exposed to a heat of about 383° of Fahrenheit, it rapidly volatilizes in white *inodorous* fumes. The alliaceous or garlic-like smell does not belong to the oxide of arsenic in a state of vapor, but is wholly confined to the fumes of metallic arsenic. When the oxide of this metal, or the common arsenic of the shops, is thrown upon hot charcoal, the garlic smell of the fumes is quite perceptible. But in this instance the oxide is decomposed, the oxygen uniting to the charcoal, and the metal escaping in the form of fumes, having a garlic odor.

"It is stated by Orfila and other chemists," says Dr. Paris, "that if it be projected upon heated copper, the alliaceous odor is evolved. This, however, takes place only when the copper is in a state of ignition, at which temperature its affinity for oxygen enables it to reduce the arsenious acid; for I find, by experiment, that if a few grains of this substance be heated on a plate of copper, by means of a spirit-lamp or blow-pipe, no odor is perceptible, for the whole of the acid is dissipated before the copper can acquire a sufficiently exalted temperature to deoxidize it. If the arsenious acid be heated on a plate of zinc, the smell is not evolved until the metal is in a state of fusion; if, instead of these metals we employ, in our experiments, those of gold, silver, and platina, no alliaceous smell whatever is produced at any temperature." The knowledge of this fact is of considerable importance in employing this experiment as a test for arsenic; for it is evident, that if the substance suspected to contain the white arsenic be subjected to heat, without being in contact with any substance capable of depriving it of its oxygen, no alliaceous odor will be evolved.

The oxide of arsenic combines with potash, soda and liquid ammonia to saturation, forming soluble arsenites, and possessing, therefore, some of the essential properties of acids.

According to the accurate experiments of Klaproth it takes four hundred parts of water at 60°, to dissolve one part of the oxide of arsenic, and only thirty parts at 212°. If it be boiled in water, and the solution be suffered to cool, it will retain thirty parts of it to one thousand of water, and deposit the superfluous part in the form of tetrahedral crystals. "This fact," observes Dr. Paris, "shows the importance of employing boiling water in every chemical examination of substances supposed to contain arsenious acid." The oxide of arsenic is also soluble in alcohol and oils.

The oxide of arsenic acts with great violence when taken internally, and commonly destroys life in a very short time. When taken in too large a dose, as, for instance, one-fourth of a grain, it excites nausea and slight chills. By continuing it in such doses, it destroys the appetite, excites vomiting, pains in the stomach

and bowels, painful diarrhœa, great anxiety and oppression in the breast, debility and emaciation, numbness of the hands and feet, dropsical swellings, tremors and paralysis. In doses above a grain it destroys life, with symptoms denoting inflammation of the alimentary canal. It is generally believed to produce its deleterious effects by acting directly on the villous coats of the stomach and bowels, producing inflammation and ulceration of these parts. This idea is certainly countenanced both by the appearance on dissection, and by the corrosive quality of this substance. Mr. Brodie, however, rejects this explanation of its modus operandi, and thinks himself warranted to conclude, from several experiments which he performed on this subject, that arsenic enters into the circulation, and that it produces its effects by acting at once upon the nervous system, the organs of the circulation, and the alimentary canal; and that death depends immediately on a suspension of the functions of the brain and heart.* This opinion is also entertained by Orfila. Dr. George F. Jaeger, of Stutgard, in a very elaborate and interesting dissertation on the effects of arsenic on various organized bodies, adduces a number of strong arguments to prove that arsenic does not produce its deleterious effects by a local action on the stomach and bowels, "nor in the manner of the acrid poisons, nor upon the nervous system; but is analogous to the poison of the viper and ticunas, which act primarily upon the blood."† It appears from the experiments of Jaeger, that arsenic is entirely inert when applied directly to a nerve. That death from arsenic does not depend on the inflammation or local lesion which it produces in the part to which it is applied, is rendered certain by the fact, that it has been known to destroy animals in a short time on being applied to wounds. Sprægel states that he sprinkled a drachm of arsenious acid into a recent wound on a dog's back, and that the death of the animal took place at the end of five hours.‡ It is a remarkable fact, also, that when arsenic destroys life on being applied to a wound, it often produces nearly the same organic effects on the membranes of the alimentary canal, as when taken internally. In the experiment just mentioned from Sprægel, "the stomach and intestines were greatly inflamed, both on their exterior and interior surface; coagulated blood was effused into their cavities, and had insinuated itself between their coats. The pleura, pericardium, and

* Philosophical Transactions for the year 1812.

† Edinburgh Med. and Surgical Journal, January, 1811. Dissertatio Inauguralis de Effectibus Arsenici in Varios Organismus, &c. Auctor, G. F. Jaeger, 1808, Tubingæ.

‡ Orfila's Toxicology, vol. i. p. 114. Sprægel, Experimenta circa varia Venena. Disp. Med. Goet., 1753.

lungs appeared very inflamed." Hunter, Home and Brodie have made the same observations. Arsenic has even been known to destroy life, when taken internally, without leaving any very manifest traces of inflammation on the stomach and bowels. There can be no doubt, however, that the extensive disorganization which this mineral commonly produces in the coats of the alimentary canal is sufficient, independent of any other effects, to destroy life; and it is, probably, in this way that it is most frequently fatal when received into the stomach. Arsenic is not only destructive of animal, but also of vegetable life. From M. Jaeger's observations, it appears that "the death of vegetables is induced by arsenic from the gradual absorption and distribution of the poison by the vessels and cellular membrane, so that the parts die in succession as the particles of the arsenic reach them." Paris states that the influence of arsenical vapors near the copper smelting works of Cornwall and Wales, "is very apparent in the condition both of the animals and vegetables in the vicinity."

Arsenic, like most other powerful substances, may be applied to very important remedial purposes. It was employed as an external remedy, both by the Greek and Arabian physicians. Dioscorides recommends its use in this way; and Athenæus speaks of some arsenical preparation as very beneficial in the form of a clyster in dysentery. It is only in modern times, however, that the medicinal powers of arsenic have been particularly noticed as an internal remedy. Nearly a century ago it was recommended in the cure of intermittent fevers by Jacobi;* and the observations of Brera and Fowler have since brought it into general notice as a remedy in this disease. By many physicians it has, indeed, been very highly extolled, and its reputation as an efficacious medicine is now well established. It is not, however, to be employed with equal advantage, or even with safety, in all cases of this disease. In patients of debilitated and cachectic habits of body, especially where a scorbutic tendency, or a disposition to passive hemorrhage exists, this remedy is apt to produce dropsical swellings, great debility, and symptoms of general depravation. It is also said to act perniciously in phthisical persons, or where there exists a strong inflammatory diathesis.

Examples of this kind, I have occasionally observed in my own practice, and I feel entirely satisfied, that, although a very powerful remedy in the majority of cases, it cannot be indiscriminately employed without running some risk of doing injury. The state of the system in which arsenic appears to be peculiarly

* Burdach, Arzneimittellehre, vol. ii. p. 475. Jacobi de Arsenici Sale alcalico domiti usu interno salutari, (Acta Academ. Elect. Mogunt. tom. i. p. 116.)

calculated to do good in this disease, is the very opposite of that which I have just mentioned as inimical to its remedial powers. In cases attended with considerable fullness of habit, not very irritable or debilitated, with a moderately full, soft, and regular pulse during the intermission, and unaccompanied by any local congestions, or organic affections of internal parts, the arsenic will, in general, act as a very efficacious and safe remedy.*

Dr. Thomas D. Mitchell, a very intelligent physician of this city, states, that while practising at Norristown, in 1820, where he had an opportunity of seeing many cases of intermittent fever, he found the bark ineffectual in the majority of instances, whilst arsenic, in the form of Fowler's solution, given from fifteen to twenty drops, almost uniformly proved successful. He never observed any injurious effects to follow its exhibition. Before giving such large doses, he had tried the ordinary ones, as from eight to ten drops, but his patients derived no advantage from the medicine when given in this way. It appears, therefore, from the statement of this physician, that where arsenic is indicated, it ought to be given in as large doses as the stomach will bear, it being much more promptly efficacious; and not more detrimental to the general habit, when thus administered, than when given in smaller doses. To children from two to five years old, he gave from one to six drops of the solution three times a day.

M. Gasc, a French physician of eminence, has lately published the result of his experience with this remedy, in the cure of intermittents. His observations were made at the hospitals of Dantzic. "The number of patients, with this fever, was so great in the hospital," says the physician, "and the disease had been so rebellious to the ordinary modes of treatment, that I determined to have recourse to the use of arsenic. My first trials with it were so satisfactory, and the successful results so numerous, that I did not hesitate to extend the use of it to almost all the cases of fever of that species in the hospital, without regard to particular complications of disease, provided they were not of a nature to contraindicate it in a positive manner." The result, he states, was highly satisfactory.†

I have myself been a good deal in the habit of employing arsenic in the cure of this disease; and have occasionally found it successful where I could do nothing with the cinchona. These two remedies are, indeed, adapted to very different states of the

* "It is a very extraordinary fact," says Dr. Paris, "that previous to the establishment of the copper-works in Cornwall, the marshes in their vicinity were continually exciting intermittent fever, whereas, since that period, a case of ague has not occurred in the neighborhood."—*Pharmacologia*, p. 282.

† London Med. and Phys. Journal, Feb. 1817.

system. The cinchona is most efficacious in a relaxed and exhausted state of the system, and will often disappoint our expectations in persons of a full and robust habit of body. In intermittents, attended with a phlogistic habit, the bark is always more effectual after the general powers of the system have been somewhat reduced by evacuants.

On the contrary, however, the arsenic, as has already been stated, would seem to be best suited to the cure of this disease in persons of a firm and healthy constitution, and most apt to act injuriously when given in a debilitated, cachectic, and irritable state of the system.

I have hardly ever employed arsenic in this disease without giving it in conjunction with opium. I have usually given the laudanum and arsenic separately: the former in the dose of from ten to fifteen drops, about half an hour after the dose of the latter. By this plan we avoid the disagreeable sickness which effectual doses of the arsenic are apt to create, and it does not appear that its powers are lessened by this mode of exhibition. This remedy has, also, been prescribed in combination with bark. These two substances are, however, chemically incompatible, the arsenical solutions forming precipitates with the bark —a circumstance which renders this combination of doubtful propriety.

Dr. Ferriar speaks very favorably of the use of arsenic in the last stage of typhus, when the tongue is covered with a thick black crust, and the ordinary tonics and stimulants do not produce any beneficial effects. By the use of arsenic, he says, the tongue very generally becomes clean.*

Arsenic has, also, been recommended as a useful remedy in rheumatism. In the chronic variety of this complaint, I have in a few instances employed it with remarkable advantage. But the powers of this remedy are more decidedly evinced in syphilitic rheumatism, and in that variety which is sometimes the consequence of the imprudent use of mercury. In rheumatic pains from this latter cause, I know, indeed, no remedy which is so effectual as the present one. Among the writers who speak more particularly in favor of the remedial powers of arsenic in chronic rheumatism, may be mentioned Kellie, Hardman and Jenkinson.

Favorable reports have also been published of the effects of arsenic in epilepsy. Drs. Duncan and Alexander give examples of its successful employment in this disease.

Dr. Ferriar speaks well of the powers of arsenic in hooping-cough, after the inflammatory symptoms have been subdued by

* Medical Histories, vol. i. p. 84.

antiphlogistic remedies. "In the beginning of this disease," says he, "when it is accompanied by symptoms of fever and inflammation, bleeding is sometimes necessary. Blisters are more frequently necessary, and Dr. Armstrong's plan of exhibiting tartarized antimony, in doses which prove gently emetic, is undoubtedly very useful; chiefly, perhaps, by supplying the means of expectoration to very young children. But after these preliminary steps are taken, I believe that the only remedy which promises to shorten the disorder effectually, is the solution of white arsenic." He gave it, at first, in the dose of one drop, for an infant; and to children under seven years, he gave two drops, daily. Dr. Klapp of this city informed me, that he has found the arsenic decidedly beneficial in the present disease. I have given it in some cases, in a few of which its good effects were conspicuous.

Arsenic has also been prescribed with success in spasmodic asthma. Dr. Alexander mentions its successful employment in this way. Of its powers in this disease, I know nothing from my own experience.

Some accounts have, also, been published of the successful employment of this remedy in tic douloureux. Dr. M'Kechnie, surgeon at Paisley, relates a case which was cured by arsenic, after various modes of practice had been tried ineffectually.* Hardman and Jenkinson, also, commend its powers in this painful affection. In periodical tic douloureux (neuralgia), arsenic is, without doubt, among the most valuable remedies we possess. Macculloch states that he has seldom known it to fail in cases of this kind.

Arsenic has recently been employed with much success in chorea. In the fourth volume of the Medico-Chirurgical Transactions, a case of this disease is related, which yielded without difficulty to this remedy. Mr. Salter, also, has given an account of four cases of chorea successfully treated with this medicine.†

Mr. Hill, in an excellent paper published in the Edinburgh Medical Journal, recommends arsenic as a highly useful remedy in hemicrania. I have, in several cases of this kind, found it promptly successful, and I know of other practitioners who place great reliance on its powers in this complaint.

In that species of cephalalgia which is commonly called sick headache, arsenic has been known to afford permanent relief. To Dr. Mease, of this city, we are indebted for the first account of its efficacy in this painful and troublesome affection. Several cases are related by this respectable physician, in which this remedy

* Edinburgh Medical and Surgical Journal, July 1811.

† Medico-Chirurgical Transactions, vol. x. part i. p. 218.

was used with perfect success. In one case I have known it to be employed with great advantage; the disease was greatly mitigated, but not completely overcome. Dr. Otto, also, employed it with success in a case of this kind.

In old and obstinate syphilitic ulcers, much benefit has been derived from the employment of this remedy. It is particularly recommended in such cases by Remer, Hagstrom, and Horn.* I have known it to be used with complete success in a case of venereal ulcerations of the septum of the nose, under the care of Dr. M'Clellan, of this city.

In the treatment of venereal nodes, arsenic is an exceedingly useful remedy. Dr. Colhoun, of this city, was, I believe, the first who published any account of its efficacy in these affections. His experience with this remedy, as published in the third volume of the American Medical Recorder, is directly in favor of its powers in this way; and Dr. M'Clellan, one of the surgeons of the Philadelphia Almshouse Infirmary, informs me that he has used it with success in several cases of this kind, and particularly in swellings of the periosteum. A remarkable case of the efficacy of arsenic in venereal nodes is reported by Dr. M. S. Baer, of Baltimore,† and my experience enables me to speak with much confidence of the utility of this practice.

Charles Lane, Esquire, gives a very interesting account of the successful employment of arsenic in an ill-conditioned ulcer of the tongue. The ulcer extended through the substance of the tongue, and passed through its root into the throat. "The general appearance," says he, "was most alarming, bearing a very strong character of carcinoma. By one month's use of this remedy the ulcer appeared perfectly healed; it, however, broke out again, and was again cured by the same means, and finally got perfectly well under its use."‡

Arsenic is a very useful remedy in certain obstinate cutaneous affections. It has been particularly recommended in leprosy and ichthyosis. "In the lepra vulgaris," observes Dr. Bateman, "the arsenical solution recommended by Dr. Fowler, is often extremely beneficial, in doses of four or five drops, which may be slowly increased to eight, and persevered in for a month and more.§ In

* Burdach's Arzneimittellehre, vol. ii. p. 469. Horn's versuche mit gebrauche des Arsenicks in veralterter Syphilis, in his Archives of Medical Experience, vol. iv. No. 257. See also Remer's Observations in the same work, vol. i. No. 9, 1812.

† American Medical Recorder, vol. iv. p. 461.

‡ Medico-Chirurgical Transactions, vol. viii. p. 201.

§ Practical Synopsis of Cutaneous Diseases, p. 33. Philad. edition.

a mild case of ichthyosis, the same writer states that "this medicine produced a complete change of the condition of the cuticle, which acquired its natural texture."* It has also been used with advantage in elephantiasis, and other chronic affections of the cuticle.

Arsenic has been employed both internally and externally in the cure of cancer. It is said to allay the pain, in the ulcerated stage of this affection, without producing either stupor or disposition to sleep. It has, however, been chiefly extolled in cancer as an external remedy. Applied in this way, it acts as an escharotic, destroying the diseased parts without affecting the sound ones, and thus enables the surgeon, in some instances, to remove the whole of the diseased parts. Richter speaks very favorably of its use in cancerous ulcers. "I have employed arsenic," says he, "in cancerous ulcers of the face, with much advantage, and without any bad or remarkable effect. I have generally used Bernard's mixture.† I lay it on about the thickness of the back of a knife. The pain which it occasions is, for the most part, inconsiderable."‡ He mentions several cases in which this mixture was applied with the most remarkable success. I have known the arsenical solution, weakened by water, to be injected into the vagina in cancer of the uterus, with evident advantage. It has, also, been applied to cancers in the form of an ointment. Plunkett's ointment§ had, at one time, very considerable celebrity in this affection. M. Dupuytren speaks very favorably of a combination of the oxide of arsenic and calomel, as a topical application in *noli me tangere.* "The actual cautery and arsenical paste seem to irritate the affected part, besides adding to the deformity, and destroying the parts to which they are applied. In such cases, a powder composed of one hundred and nineteen parts of calomel, and one part of arsenic, acts like a charm. If the surface of the ulcer is moist and clean, the powder is to be

* Practical Synopsis of Cutaneous Diseases, p. 53.

† This mixture consists of factitious cinnabar ʒii; ashes of burnt shoe soles gr. viii; dragon's blood gr. xii; white arsenic gr. xl. Reduce them all to a fine powder, and mix them intimately. "When it is used some of it is mixed with so much water as to form a thin paste, which, by means of a small hair pencil, is applied to the whole surface of the ulcer." Richter calls this Bernard's preparation, but it was first employed and published by the celebrated lithotomist, Frère Cosme.

‡ Medical and Surgical Observations, p. 47.

§ This ointment is composed of arsenic, sulphur, the powdered flowers of the ranunculus flammula, and the cotula fœtida, made into a paste with the white of eggs.

sprinkled on so as to form a thin coat. If the diseased surface is covered with a crust, a poultice must previously be applied to remove it. If an imperfect cicatrix cover the sore, this must be removed before the powder is applied. If the powder does not adhere, increase the proportion of arsenic, and mix it with mucilage. The powder must be left to fall off of itself, which usually happens in about ten days, when it is to be reapplied. Five or six applications are generally sufficient."*

Arsenic is now usually prescribed in the form of Fowler's solution. The dose for an adult, of this, is from eight to fourteen drops. It may also be given in the form of pills, with opium or some of the other narcotic extracts, in the dose of one-fourteenth to one-eighth of a grain.

The *arseniate of ammonia* is an excellent arsenical preparation for medicinal purposes. It may be made in the following way: Dissolve one part of the oxide of arsenic in four parts of nitric acid with half a part of muriatic acid; saturate the solution with carbonate of ammonia, and crystalize the arsenic by evaporation. For use, one grain of this salt is to be dissolved in an ounce of distilled water; and of this solution from twenty to twenty-five drops is to be taken at a dose to the amount of a drachm in the course of twenty-four hours. Biett asserts that this is decidedly the best arsenical preparation we possess; and my own experience fully confirms this opinion.

Antidotes.—Sugar and water, or a decoction of linseed and mallows, drank in large quantities, are said to be our best means for counteracting this poison. By taking copious draughts of any of these, vomiting is excited, and the arsenic ejected. Lime-water with sugar, has also been highly recommended. Orfila states that "theriac, oil, gall-nuts, the bark of the pine, liver of sulphur, vinegar, suggested by some, ought not to be used, because they are not only useless, but often injurious." In addition to these remedies, warm fomentations and leeches must be applied to the abdomen; general bleeding, promptly and largely employed. When the fever abates, the patient should be directed to take veal or chicken broth; and when convalescent, rice-milk, gruel, &c. Wine, spirits, and solid food must be avoided. "Wine, regarded by many persons as proper to restore action, is, in this case, a new poison, which acts precisely as that, the effects of which we have combated. It is only after three or four days that solid food is to be taken, in small quantities, and such as is of easy digestion."†

* Formulaire Pratique des Hôpitaux civiles de Paris, &c., par Ratier, 1825.

† Orfila.

Formulæ.

℞.—Solutionis arsen. Fowleri gtt. lx;
Tinct. opii gtt. lx;
Spir. lavend. compos. ʒi;
Aq. cinnamomi ℥iii.—M. Dose, a tablespoonful for an adult; a teaspoonful for a child.

Asiatic Pills.

℞.—Oxidi arsenici gr. iii;
Pulv. piper. nigri ℈i;
Conserv. rosar. q. s.—M. Divide into twenty-one pills.

℞.—Oxidi arsenici gr. iv;
G. opii gr. vi;
Muriat. ammon. gr. xxiv;
Extract. gentianæ ℈ii.—M. Divide into forty-eight pills. Two pills are to be taken at a dose.

CHAPTER VII.

II. *Medicines calculated to correct certain morbid states of the system, by acting on the contractility of the muscular fibre.*

ASTRINGENTS.

ASTRINGENTS are substances that produce constriction or condensation in the living animal fibre. Of the modus operandi in these remedies we know nothing of a satisfactory character. It is certain, at least, that it cannot be explained, as Cullen supposed, on the principle of their action in the process of tanning. It is by producing a *peculiar* excitement in the living, contractile, and irritable fibre that these substances produce their effects. Further than this general and vague fact, we shall never, probably, be able to go, in our inquiries upon this point.

Various opinions have been entertained, relative to the particular principle which gives to substances their astringency. By some, it has been supposed to be the gallic acid: others have considered it as constituted by an union of this acid with an earthy base; and others, again, have regarded *tannin* as the astringent principle. That these hypotheses are not entitled to any credit, is evident from the fact, that some of the most astringent substances known, contain neither tannin nor gallic acid. The truth is, that the proximate principle of remedies is just as inscrutable as the *essential* character of the impressions which they produce on the living system. These are objects which the human mind cannot reach, and about which all our most ingenious speculations are worth nothing.

Astringent substances are applicable to a great variety of remedial purposes. In the treatment of excessive evacuations, especially of hemorrhages, they have been recommended in all ages. In hemorrhage from the nose, lungs, stomach, bowels, and uterus, astringents are, indeed, often of decided utility. They are not, however, to be employed without reference to the state of the general circulation. In what is called active hemorrhage, where there are tension and force in the pulse, astringents, except, perhaps, the sugar of lead, should never be employed without previous depletion.

In the treatment of dysentery, astringents were formerly much employed. At present, however, their use, in the early stages of this disease, is very justly considered as highly pernicious. Cullen was one of the first who spoke decidedly against their employment in this complaint. Although his objections to their use are unquestionably correct, they were not founded upon just views concerning the nature of dysentery. He supposed that this disease depends on an "increased constriction of a considerable portion of the intestinal canal," and concluded, therefore, that astringents must do harm by increasing still more this constricted state of the bowels. The pathology of this complaint is, however, better understood at present, it being well established that it is essentially connected with an inflamed state of the intestinal canal. It is on this account that astringents act perniciously in the early stages of this disease. They not only tend to increase the general inflammatory excitement of the system, but their direct action upon the tender and irritated surface of the bowels, is calculated to do much mischief, by increasing the local intestinal inflammation. They are further injurious by confining the vitiated and irritating contents of the bowels. After the inflammatory symptoms have been subdued, and proper evacuations made from the bowels, the employment of mild astringents may, sometimes, be resorted to with benefit. As a general rule, however, they are to be regarded as improper, especially in the dysenteries of this climate. In tropical dysentery, as it has been called, astringents are more frequently useful. But even here they require a cautious employment.

In the treatment of diarrhœa, astringents are more generally useful. They are not, however, to be employed, even in this complaint, without some risk of doing harm, when febrile symptoms accompany the disease, or when administered without having previously unloaded the bowels of their vitiated contents, by proper purgatives. When given without these precautions, they are apt to give rise to colic, headache, and other unfavorable symptoms. When the disease is protracted, and no signs of a phlogistic tendency be present, we may, in general, use astringents with advantage. In cases of this kind I have found very minute doses of calomel, given in union with some vegetable astringent, exceedingly useful.

Astringents are also employed in leucorrhœa. In that form of the disease which Dr. Darwin calls the *fluor albus frigidus*, these remedies are sometimes beneficial. When there is much febrile action connected with the complaint, they are, however, universally injurious. The usual and best way of employing astringents in this disease, is in the form of injection. They are not unfre-

quently, also, given internally; but it does not appear that they are capable of doing much good when thus employed. In using astringent injections in this complaint, we should take care that we adapt the strength of the injection to the degree of sensibility and irritation in the affected parts. Where there is considerable *ardor urinæ*, with other marks of a phlogistic state of the internal surface of the vagina, the astringency of the injections should be very weak, and employed for the purpose, rather of washing away the irritating secretions, than with a view to arrest the discharge by an impression made on the parts affected.

The employment of astringent injections in gonorrhœa, is exceedingly common. Many writers, however, reprobate their indiscriminate use in this complaint, and there can be but little doubt, that much mischief is often done by their employment. During the early or more inflammatory stage of the complaint, they can never be useful, and seldom fail to do harm. The consequences which may result from their imprudent use are, chordee, hernia humoralis, stricture, violent inflammation in the urethra and neck of the bladder, phymosis, &c. After the discharge has continued for some time, and the general as well as local inflammatory action has been reduced by antiphlogistic measures, mild astringent or stimulating injections are of unquestionable utility. Too little attention, however, is commonly paid to general remedies in this affection. Bleeding, saline purgatives, and a low diet, are of essential service in the early stage of the majority of cases of this kind. By these measures, and the liberal employment of balsam copaiva, we may, for the most part, cure the disease speedily and safely.

Astringents are, also, much used as external applications to inflamed parts. In ophthalmia, they may often be employed with great advantage. In this, however, as in the former complaint, they may also produce much mischief, by being applied during the early or active stage of the inflammation. When the local and general inflammatory action has been reduced by proper antiphlogistic means, moderately astringent collyria are generally very serviceable. In aphthous ulcerations of the mouth and throat, or in inflammation or relaxation of the palate and tonsils, astringent gargles are much employed. In prolapsed parts, as of the uterus and anus, also, astringent injections are often of great service.

Some writers have supposed that astringents possess the property of relieving the symptoms of urinary calculi. This opinion is certainly countenanced by the beneficial effects which *uva ursi* produces in affections of this kind. But it would appear that the antilithic powers of this substance do not reside in its astringency,

since we know of no other astringent that possesses any obvious powers in this way.

The class of astringent substances is very numerous. The property of astringency is especially common in the barks and roots of vegetables. The mineral astringents are, generally, much more powerful than those which are obtained from the vegetable kingdom. The majority of the latter are connected with other active properties; the former are, for the most part, purely astringent; or astringent and tonic.

CORTEX QUERCI.

The genus quercus is a very extensive one, and the barks of all its different species possess more or less astringency. That which is employed in medicine, is chiefly obtained from the black oak, (*Querces tinctoria*, Mich.,) although some of the other species of this family furnish us with barks, equally, if not more astringent. The late Professor Barton was of opinion, that the chestnut and Spanish oak barks (*Q. monticola, Q. falcata*), are preferable, in most cases, to the black oak bark; he asserted that they possess all the useful properties of the *tinctoriæ* in a superior degree, without partaking of the purgative quality of the latter.*

Oak bark contains a very large proportion of *tannin*, which is readily extracted by infusion. It appears, from the experiments of Mr. Davy, that the proportion of tannin varies according to the age of the tree from which the bark is taken; the younger containing more of this principle than the older bark.

The oak bark was very early employed in medicine. Galen recommended a decoction of the leaves and outer bark of the oak, in dysentery, uterine and pulmonary hemorrhages, and in fluxus cœliacus.† It is undoubtedly one of the most powerful vegetable astringents we possess; and capable, as such, of being applied to very useful purposes in medicine. In the treatment of intermittent fevers, it has been recommended as a remedy of very considerable efficacy.‡ I have known it to be given in this disease with prompt success; it is, however, exceedingly disgusting to the taste, and few patients can be induced to take it. In the intermittents of very young children, I have, in a few instances, used the oak bark decoction, as a bath, with benefit. But there are other indigenous barks of superior efficacy in this respect, and

* MS. Lectures on Mat. Med.

† Alibert, Nouv. Elém. de Thérap., vol. i. p. 93.

‡ Dr. Rousseau, Philad. Med. Museum, vol. ii.

they do not, like this one, give so disagreeable a dye to the skin. In chronic diarrhœa, this bark has been found very serviceable. Its employment in dysentery is, however, very objectionable, except, perhaps, in the last stage of very protracted cases. As an injection in leucorrhœa, the infusion of oak bark has been much recommended by some writers, and I have myself employed it in this way with very good effects. It is also a useful application in inflammation and swelling of the fauces, prolapsus uvulæ, and cynanche tonsillaris. "In many cases," says Dr. Cullen, "this decoction early applied, has appeared useful in preventing those disorders." I have, indeed, almost constantly joined a portion of alum to these decoctions; but I have frequently found that a solution of alum alone, of the strength it could be conveniently employed in, did not prove so effectual.

Bathing in a decoction of black oak bark has also been recommended as an efficacious remedy in tabes mesenterica. Dr. J. Fletcher, of Virginia, has reported four cases of this disease which yielded readily to purgatives, together with bathing twice a day in a strong decoction of this bark.* The inhalation of the finely powdered oak bark has been known to produce very excellent effects in pulmonary consumption. An instance of this kind was communicated to me some years ago by William Webb, of Lancaster county. He informed me that a man who had labored under the usual symptoms of confirmed phthisis, was advised to employ himself in grinding bark for a tanner in his neighborhood. He was extremely weak and emaciated when he went into the bark-mill; in a short time, however, the cough, night sweats, and other hectic symptoms began to abate, and in less than three months he was perfectly restored to health.

The powdered oak bark, in the form of a poultice, is an excellent application to mortified or gangrenous parts. Dr. Barton employed it both internally and externally with great success, in a case of gangrene of the foot.†

Mr. Lizars has recently published some observations on the efficacy of oak bark in the cure of reducible hernia, in which he declares that he has used it with "wonderful success."‡ He directs it to be used in the following manner:—a strong decoction is to be made by boiling a few pounds of the bark over a gentle fire for two or three days, adding a little boiling water from time to time, so that the bark may be always covered. This decoction is to be strained and evaporated to the consistence nearly of an

* Am. Med. Recorder, vol. iii. p. 363.

† Collections towards a Mat. Med. of the United States, p. 11.

‡ Edinburgh Medical Journal, No. 72.

inspissated juice. Previously to using this inspissated decoction, it should be warmed in order to suspend the astringent matter. The hernia having been reduced, the groin is to be bathed with the decoction three or four times a day, and the truss applied. Mr. Lizars states, that he has cured hernia of many years' standing in the course of a few weeks.

It may be observed that the use of oak bark for the cure of hernia is by no means a new practice. Desessarts employed the powdered bark for this purpose more than fifty years ago.* He put it into small muslin bags which he moistened with wine, and laid on the groin under the pad of the truss, having previously returned the hernia. He affirms that it seldom required more than a few weeks to perform a perfect cure in children. In the 35th number of the Gazette Salutaire, the efficacy of a strong decoction of this bark in hernia is strongly insisted on;† and Kæmpf, a writer of great respectability, says, that the good effects of the oak bark in the cure of hernia cannot be too highly praised ‡

For internal use an ounce of the powdered bark is to be boiled in two pints of water down to one pint. The dose of this is from one to two ounces.

The leaves and cups of the acorns differ very little in astringency from the bark. The acorns possess more of the bitter principle, and, on being roasted, evolve a considerable portion of an empyreumatic oil. These have been highly recommended in tabes mesenterica.§ They are also said to be very serviceable in spasmodic cough, asthma, chronic hysteria, amenorrhœa,‖ diarrhœa, and rheumatism. They are given to the extent of from one to two ounces daily. They are used, by some, as a beverage instead of coffee.

Formulæ.

℞.—Cort. querci ℥iv;
Aq. fontanæ ℔iv; coque ad reman. ℔ii; colat., adde
Sulphat. aluminis ʒiss.—M. This forms an excellent injection in leucorrhœa; and may be beneficially used as a gargle in relaxed uvula.

* Gardane, Gazette de Sante, 1775.

† Richter's Chirurgische Biblioth., B. iv. p. 25.

‡ Von einer neuen methode die hartnæckigsten krankheiten zu heilen, &c., p. 382.

§ Kaiser von dem Nutzen der Eichlen in der dörrsucht der kinder. Frankfort, 1784, 8.

‖ Marx, Geschichte der Eichlen, &c. Burdach's Arzneimittellehre, tom. iii. p. 564.

℞.—Pulv. cort. querci ℥i;
—— rad. serpentariæ ℥ii;
———— rhæi ℥ii;
Supercarbonat. sodæ ℥i.—M. Divide into eight equal parts. One every two hours—in intermittents.

GALLÆ.

The gall-nuts of commerce are obtained from the quercus cerris, a species of oak indigenous to Asia Minor, "from the Bosphorus to Syria, and from the shore of the Archipelago to the frontiers of Persia." It is also found growing in the southern countries of Europe. The galls are excrescences from the young shoots of this tree, and are produced by the puncture of an insect (diplolepis gallæ tinctoriæ) to deposit an egg. They are nearly round, and studded with a number of rough wart-like tuberosities. They are hard, and when broken, exhibit a smooth or flinty fracture. They have no odor, but are extremely astringent, and bitter to the taste. Both water and alcohol extract their active principles. According to Neumann's experiments, water extracts seven-eighths of their substance, alcohol a little more than seven-eighths.* The chemical composition of galls does not appear to be as yet perfectly ascertained. Sir H. Davy obtained from five hundred grains of Aleppo galls, one hundred and thirty grains of tannin, twelve of mucilage and matter rendered insoluble by evaporation, thirty-one of gallic acid, and a little extractive matter, and twelve of calcareous earth and saline matter.

Besides these component parts, it appears, from the experiments of M. Braconnot, that the gall-nut contains a peculiar acid, distinct from the gallic acid, and to which he has given the name of *ellagic acid*.† The infusion and tincture of galls strike a black precipitate with iron. The precipitate formed by the acetate and subacetate of lead is grayish; that by tartarized antimony, yellowish; by sulphate of copper, brown; sulphate of zinc, reddish-black; nitrate of silver, deep olive; and nitrate of mercury, bright yellow.‡ Concentrated sulphuric acid produces a copious milk-white curdy precipitate, which soon becomes brown, and assumes the appearance of a resinous substance. This precipitate is soluble in alcohol and boiling water. It consists of tannin and extractive matter, and is powerfully astringent. Nitric acid destroys the astringency of the infusion, but does not produce any precipitate; muriatic

* Chemica Media, vol. ii. p. 2.
† Annales de Chimie, vol. ix. p. 187, new series.
‡ Paris's Pharmacologia.

acid forms a white flaky precipitate. The carbonate of potass produces a similar white precipitate, which consists of tannin, lime and potass, and destitute of astringency. It is but very sparingly soluble in water and alcohol. Lime-water occasions a precipitate of a dark-green color. Animal jellies and starch precipitate the tannin from the infusion.

Galls are a very powerful astringent, and may be usefully employed in cases where such remedies are indicated. They were at one time a good deal prescribed in the cure of intermittents, but it does not appear that they possess sufficient febrifuge power to entitle them to much attention in this respect. M. Poupart has made a favorable report on this subject in the memoirs of the French Academy for the year 1702; but according to Bergius, galls are very pernicious when employed in this disease. Cullen, however, states that they produce no bad consequences when given with gentian or other bitters.*

The infusion of galls has been recommended as a very useful injection in leucorrhœa and in gleet. In chronic diarrhœa, also, we may often derive much advantage from this remedy when prudently administered. In ulcers or inflammation of the palate, tonsils, or gums, and in relaxation of the uvula, the infusion forms an excellent astringent gargle.

An ointment made of one part of finely powdered galls to eight of lard, forms a very useful application in hemorrhoidal affections. In internal piles the decoction has been injected into the rectum. Such a practice is, however, not to be rashly imitated. The sudden suppression of hemorrhoidal discharges, by applications of this kind, has been often productive of very serious consequences; epilepsy, apoplexy, phthisis, and other dangerous affections have been induced in this way. Where the discharge has not as yet become habitual, and is very profuse, the employment of astringent injections may often be resorted to with advantage. As a general rule, however, the practice is not to be recommended. In prolapsus ani and uteri, injections of the infusion of galls are generally very useful.

Formulæ.

℞.—Gallarum. contusar. ℥i;
Aq. bullientis ℥vi.—Infuse for four hours, strain and add,
Cretæ præparat. ℥ss;
Tinct. opii ℥i;
G. Arab. ℥ss.—M. Dose, a tablespoonful every two or three hours, in diarrhœa.

* Mat. Med., vol. ii. p. 34.

℞.—Pulv. gallarum ʒi;
—— camphoræ ℈i;
—— opii gr. x;
Adipis suillæ ʒi;
Misce. ft. unguentum.—Used in hemorrhoidal affections.

GERANIUM MACULATUM.

The geranium maculatum, or spotted cranesbill, grows abundantly in almost every section of the United States. The root, which is the only part used for medicinal purposes, is thick, rough, and knobby. Externally the dried root is of a dark brown, and internally of a pale flesh color. It is one of the most powerful and pure vegetable astringents with which we are acquainted. According to Professor Bigelow's experiments, it contains a considerable proportion of tannin, and some gallic acid. "The gallic acid is indicated by the dark precipitate remaining in solution. It differs, however, from the acid of oak galls in not reddening vegetable blues, and not passing over in distillation."* Its active principles are readily extracted both by alcohol and proof spirits. The tincture is strongly astringent.

This root is the most agreeable astringent we possess. Its astringency is not associated with bitterness or any other unpleasant taste. In the diseases of children, where astringents are indicated, a decoction of it in milk is a very convenient and efficacious remedy. In this form it has been a good deal used in cholera infantum, and I have myself repeatedly prescribed it, in protracted cases, with great benefit. I have, also, administered the powdered root in union with calomel, in the proportion of gr. vi of the former to one-sixth of a grain of the latter, with much advantage in this affection. In the advanced stages of diarrhœa and dysentery, after proper evacuations have been made, it has proved very beneficial. In my own practice I have occasionally given it in cases of this kind with very good effects. I have also used the watery infusion as an injection in gonorrhœa, but not with any decided benefit. In aphthous affections of the mouth this remedy is frequently very useful. In a chronic and very obstinate case of ulceration of the mouth the patient was perfectly relieved by the use of gargles made of this root, after a great variety of other substances had been tried unsuccessfully by myself and others. Dr. Mease recommends it as very efficacious in restraining internal hemorrhages; and Dr. Thacher says, that he has known the infusion to restrain hemorrhage from the

* Bigelow's American Medical Botany, vol. i. p. 89.

lungs in a very prompt manner. It is said that the western Indians consider the geranium as the most effectual remedy they have for the venereal disease.

From considerable experience with this medicine, as well as from the testimony of many other physicians, I am entirely satisfied that it is one of the most useful vegetable astringents we possess. The saturated tincture may be given in doses of from one to two drachms. In substance it may be given to the extent of thirty or forty grains.

OROBANCHE VIRGINIANA.

The orobanche Virginiana, or beech drop, is a parasitic plant, growing almost exclusively on the roots of the beech tree. It is herbaceous, from six inches to a foot in height, and commonly of a pale yellow color. The root is tuberous, clay-colored, and covered on its lower part with a number of small fibres. The stem is erect, and furnished "with short ovate scales instead of leaves, of which it is entirely destitute."

The root of this plant is powerfully astringent, and has been frequently employed as such in the practice of some of our physicians. It entered as an ingredient into the famous cancer powder of Dr. Martin; and Dr. Barton observes, that "it has been of great service, externally applied, to obstinate ulcers, some of which had resisted the applications that are commonly made use of in such cases." In aphthous ulcerations of the mouth I have known it to be highly beneficial. I have also used a strong decoction of this root as a wash in an obstinate cutaneous affection of the herpetic kind, with complete success. Internally I have never employed it; I do not doubt, however, of its applicability to all the purposes for which vegetable astringents may be useful. In some parts of this country it is a common remedy for diarrhœa and dysentery.

HÆMATOXYLON CAMPECHIANUM.

This tree, which furnishes the logwood of commerce, is a native of South America, and is particularly abundant in the province of Honduras, whence it was brought into Jamaica, where it now grows very plentifully. The wood is compact and heavy, and of a deep red color internally. When split open it has a peculiar sweetish odor. Its taste is sweet, followed by a slightly bitter astringency. The coloring matter of logwood may be obtained in a separate state, in the form of small brilliant crystals

of a reddish-white color, and of a sub-astringent, bitter and acrid flavor. This crystaline substance has recently received the name of *hematin*. The infusion of logwood is of a deep blood red color. By adding to it the sulphate of iron it becomes black; the solution of the sulphate of alumine changes it to a purple color, which by the admixture of some potass assumes a fine violet hue.* The oxydulated sulphate and nitrate of iron change the blood red decoction to a very beautiful dark blue. Carbonate of iron strikes a dull black precipitate, leaving a brown supernatant fluid. Muriate of tin forms a light and loose red precipitate with both the decoction and infusion, leaving the fluid as clear and colorless as water. Phosphate of lime renders the color somewhat more light, and forms, after some time, a dark brown precipitate. The alcoholic tincture is of a dark yellowish red color, possessing the same chemical habitudes as the watery infusion. Water distilled from logwood remains perfectly clear, but acquires the peculiar odor of the wood.

When the decoction is taken internally it very soon gives a deep red color to the urine. By some practitioners it has been recommended as a very efficacious remedy in dysentery and diarrhœa. Dr. John Hunter asserts that he found the extract of logwood very serviceable in cases of dysentery where the discharges were frequent and copious, and not attended with much tormina.† It has, also, been used with advantage in the chronic form of cholera infantum,‡ and I have known it to be given with excellent effects in a case of diabetes.

The best form for exhibiting this remedy is an infusion. A cupful of this may be taken every three or four hours. The extract is, also, frequently employed. It may be given in doses of from twenty to thirty grains.

RUBUS VILLOSUS.

The bark of the blackberry root is a pure and powerful astringent, and is now a good deal employed as such, both in popular and in domestic practice. The sulphate of iron changes the color of both the infusion and decoction into a beautiful dark purple, and occasions a copious precipitate. Gelatin also produces a copious white and opaque precipitate. The alcoholic solution undergoes a partial decomposition on adding water to it. The

* Dissertatio de Hæmatoxylo Campechiano. Vide Pfaff's System der Mat. Med., t. ii. p. 213.

† Treatise on the Diseases of Jamaica, p. 186.

‡ Dr. Chapman's Therapeutics and Mat. Med., vol. ii. p. 270.

precipitate thus formed is of a flocculent appearance, and when dry, "exhibits the common resinous properties on exposure to heat."*

This root has been much extolled by some late American writers for its efficacy in the cure of chronic dysentery, diarrhœa, and cholera infantum. I have myself employed it with advantage in the latter complaint. I prefer, however, using the geranium maculatum, as being much more pleasant to the taste. I have seen an infusion of the blackberry root used in a case of hematemesis with apparent advantage. I have also known it to be used with very good effects as an application in the form of a cold poultice, in hemorrhoidal tumors. As an astringent, this article may, no doubt, be usefully employed, wherever such remedies are indicated.

The berries of this bramble have also been used in medicine. Dr. Mease says, "a jelly made of blackberries, when on the turn from red to black, is much used in the United States for gravel." It has been said that a decoction of the root of this plant is very useful in gravelly complaints. I am not aware, however, that there is any foundation for this opinion.

KINO.

This is an inspissated vegetable juice, possessing very great astringency. The natural history of the trees from which it is obtained is, as yet, but imperfectly known. The kino of commerce consists of three distinct kinds: "The first is in very small jet-black fragments, perfectly opaque, without smell, crackling under the teeth when chewed, not coloring the saliva, after some time imparting only a slight astringent taste, not fusible, and difficultly reduced to powder." There is another kind which consists of large pieces, of a very dark-brown color, resinous appearance, and interspersed with little air cells; very thin pieces of it are translucent, and of a ruby red color; when chewed it crackles under the teeth; its taste is at first slightly acid, which soon changes to a very bitter and astringent one, "succeeded by a peculiar sweetness. It is infusible, and forms a reddish-brown powder." This variety of kino is obtained from the juice of the coccoloba uvifera. There is a third variety of this substance, which consists of dark brown pieces of different sizes. It is generally covered with a reddish-brown powder, has a resinous and unequal fracture, and is often mixed with bits of leaves, twigs, &c. Very thin pieces are transparent; it crackles but slightly

* Bigelow's American Medical Botany, vol. ii. p. 163.

under the teeth, and its taste is astringent, followed by sweetness. This variety is obtained from the eucalyptus resinifera, a tree indigenous to New South Wales.* "The London College," says Dr. Duncan, "have indicated the butea frondosa as the source of kino, but certainly erroneously." It, however, produces, in large quantities, a red juice very analogous to kino, and which may unquestionably be used as a substitute for it. The production of these substances from so many different trees in Africa, America, Asia, and New Holland, shows that kino is to be considered as a genus of which these are species.

Kino contains a very large proportion of tannin, and does not possess any of the characteristic habitudes of the resins or gum-resins. According to Vauquelin's analysis, one hundred parts of kino consist of seventy-five of tannin, twenty-four of red mucilage, and one of fibrous matter.† Cold water dissolves about four-fifths of its substance; but in hot water it is much more soluble; and hence the decoction, on cooling, lets fall a copious reddish brown sediment, and becomes turbid. Alcohol dissolves the whole of this substance except its impurities. "It is remarkable," says Dr. Duncan, "that alcohol dissolves kino entirely, but does not dissolve the residuum of the decoction." The solutions of kino form a grayish yellow precipitate with acetate of lead—a reddish yellow one with nitrate of silver, a yellowish white one with tart. antimon.—and a green one with sulphate of iron. Gelatin, also, precipitates the solution of kino.‡ By exposure to heat kino becomes soft, and if the heat is very considerable, it slowly enters into fusion.

This substance was first introduced to the notice of the profession as a useful remedial article, by Dr. John Fothergill, about eighty years ago.§ It has been recommended as an efficacious remedy in intermittent fevers, given either by itself or in conjunction with some of the bitter tonics. In the advanced stages of diarrhœa, and in chronic dysentery, it is very frequently employed; and I do not doubt that it will generally answer all the useful purposes in these complaints, that can be obtained from astringents. In the bowel-complaints of children especially, it may often be very advantageously given in union with chalk and small portions of laudanum. The aqueous solution of kino has been highly recommended as an injection in the cure of fluor albus and gonorrhœa.

* Dr. Duncan's Dispensatory.

† Ann. de Chimie, tom. xlvi. p. 321–332.

‡ Pfaff's Mat. Med., tom. ii. p. 200.

§ A letter from Dr. John Fothergill to the Medical Society, concerning an astringent gum brought from Africa. See Med. Observ. and Inquir., vol. i. p. 358.

In the former of these complaints a solution of this substance in lime-water, is said to be particularly useful. Its use in this way is objectionable, however, on account of its staining everything with which it comes in contact, of a blood red color. It has, also, been employed with good effect in diabetes; and Pemberton speaks very favorably of its virtues in pyrosis. Some practitioners have found it to produce excellent effects in certain varieties of hemorrhage, more especially in protracted menorrhagia, from laxity of the solids. Gillespi recommends a solution of kino in red French wine, as an excellent application to foul scorbutic ulcers.*

Kino is given in substance, in doses of from ten to thirty grains. It is also very frequently given in the form of tincture; from twenty to forty drops of which may be administered for a dose.

Formulæ.

℞.—Tinct. kino,
—— ipecac., āā ℥ss;
—— opii ℥ii.—M. Take from thirty to forty drops every two or three hours. This is an excellent mixture in chronic dysentery and diarrhœa.

℞.—Pulv. kino gr. xxvi;
—— opii gr. ii;
Mucilag. g. Arab. q. s.—M. Divide into ten pills. Take two every three or four hours—in diarrhœa, &c.

CATECHU EXTRACTUM.

The tree, *mimosa catechu*, which furnishes this extract, is a native of Hindostan, and is said to be particularly abundant on the uncultivated mountains of Rotas and Pallamou, in the province of Bahar, westward of Bengal.† Catechu is, however, also obtained from other species of mimosa; and at Bombay it is principally prepared from the nuts of the areca catechu. The catechu obtained from the mimosæ, is prepared from the internal part of the wood by decoction, and evaporation in the sun.

This substance comes to us in compact, hard, brittle, flat pieces, of a dark brown color; and, when broken, exhibiting light and dark brown streaks. It possesses a powerfully astringent taste, succeeded by a slight sensation of sweetness in the mouth. It has no odor. Its specific gravity varies from 1·28 to 1·39.

* London Med. Journ., vol. iv. p. 373.

† For a good account of the tree producing the catechu, and of the mode of preparing this substance, see Med. Obs. and Inquir., vol. v. p. 148.

Formerly it was thought to be a mineral product, and was, therefore, described under the improper name of *terra japonica*. Hagedorn and Boulduc* were among the first who opposed this error, and who established the fact of its vegetable origin. According to Mr. Davy's analysis, two hundred grains of Bombay catechu, contain one hundred and nine grains of tannin, sixty-eight of a peculiar extractive matter, thirteen of mucilage, and ten of residual matter. Bostock found traces of gallic acid in catechu. That which is brought from Bengal contains less tannin. It is almost wholly dissolved both by water and proof spirits. The oxysulphate of iron produces a beautiful green precipitate with the aqueous solution of this substance, which changes to an olive green, with a faint shade of brown, by the further addition of some muriate or nitrate of iron. Lime, barytes, and strontian, produce copious light-brown, and the preparations of copper, dark-brown precipitates. It also forms a copious precipitate with gelatin. The concentrated muriatic and sulphuric acids produce pale precipitates, and the fuming nitrous acid destroys its property of precipitating the solutions of lime and iron.

The catechu was formerly much employed by physicians, and it is, unquestionably, an article of strong and useful astringent powers. In diarrhœa, and the advanced periods of dysentery, it is equal, if not superior, to any of the vegetable astringents we possess. It is also said to be a very valuable remedy in fluor albus, when employed in the form of an injection. Combined with gentian, it has been used with success in obstinate intermittents.† In relaxation of the uvula, and ulcers of the mouth and fauces, it has been known to produce very excellent effects. It has, also, been prescribed with much advantage in general relaxation of the system with debility of the digestive organs.

Clysters of a solution of catechu have been recommended as highly useful in restoring tone and energy to the bowels, in cases of colica pictonum.‡ Mr. James Kerr states that this substance forms a principal ingredient in an ointment of great repute among the Hindoos, composed of sulphate of copper ʒiv, catechu ℥iv, alum ʒix, white resin ℥iv, reduced to powder and mixed with olive oil and water sufficient to bring the mass to the consistence of an ointment. This ointment they use in all kinds of ulcers. "A gentleman," says Mr. Kerr, "of great practice, told me he used this ointment with success beyond expectation."§

The catechu is administered both in the form of a powder and

* Mém. de l'Acad. des Sciences de Paris, A. 1709, p. 228.

† Dr. Barton, in a note to Cullen's Mat. Med., vol. ii. p. 31.

‡ Chirurg. Arzneimittellehre, von C. L. Römer, B. i. s. 119.

§ Medical Obs. and Inq., vol. v. p. 158.

of tincture. The former is given in doses of from grs. x to ℈i. The latter from thirty to sixty drops. It is, also, occasionally prescribed in the form of an electuary and in lozenges. The latter, by gradually dissolving in the mouth, may be very conveniently and beneficially used in relaxation of the palate and fauces.

Formulæ.

℞.—Catechu ℥ss;
G. Arab. ℥i;
Pulv. aluminis ℈ii;
Aq. menth. pip. ℥iv;
Vin. alb. generos. ℥ii.—M. Dose, a tablespoonful every two hours.

℞.—Pulv ipecac. ℥ss;
—— catechu ℥i;
—— opii gr. iii;
Sacch. albi ℥i.—M. Divide into twelve equal parts. Take one every two or three hours.

SUPERACETAS PLUMBI.

The acetate or sugar of lead consists of irregular masses resembling lumps of white sugar, "being an aggregation of acicular four-sided prisms, terminated by dihedral summits." Its taste is sweet and styptic. When exposed to the air, it slightly effloresces, and is decomposed by heat and light. It is soluble in twenty-five parts of water, and also in alcohol. The aqueous solution is turbid and of a milky color, but becomes transparent on adding a small portion of acetic acid to it. It is decomposed by the "alkalies, alkaline earths and their carbonates, most of the acids, alum, borax, the sulphates and muriates, soaps, all sulphurets, ammoniated and tartarized iron, tartarized antimony, undistilled water."

When taken internally, the sugar of lead produces a sensation of constriction on the fauces, and along the whole course of the œsophagus. It accelerates the frequency of the pulse, but does not augment its strength or volume.*

The effects of the continued influence of lead on the animal body, are of a nature so distressing and dangerous, that it was long before physicians would venture on the internal employment of the saturnine preparations. We find, however, that the sugar of lead was occasionally used as an internal remedy as early as the days of Paracelsus. This eccentric genius extolled it as a remedy of great powers in diseases of the thoracic viscera, all of

* Semme's Inaugural Thesis on the Effects of Lead, &c., Philad., 1801.

which he included under the general name of asthma.* Its internal use was, also, strongly recommended in all species of dropsies, by Goulard; and Wuerz and Gramannus, of the sixteenth, and Libavius, Raumer and others, of the seventeenth centuries, employed it freely as an internal medicine. The use of lead in this way, was, however, strongly opposed by Stahl, Hoffmann, Boerhaave, and subsequently by Sir G. Baker,† and the authority of these names proscribed almost wholly, for a time, its internal employment. But the apprehensions of the profession, in this respect, gradually gave place to the accumulating testimony of experience in favor of its general inoffensiveness; and it is now pretty commonly admitted, that, although not destitute of deleterious properties, the sugar of lead may be exhibited internally in a variety of affections with great benefit and without the least injury, if managed with prudence and judgment. It must be confessed, however, that this remedy has been known to produce injurious effects even under the most judicious administration; and we are, therefore, not to resort to it with an entire assurance of its being uniformly innoxious. Like all our heroic remedies, it is capable of doing a great deal of good, and, also, under unfavorable circumstances of administration and constitutional predisposition, much harm.

The sugar of lead was very early recommended as a useful medicine in phthisis pulmonalis. The Pharmacopœia Bateana contains the formula of a tinctura anti-phthisica,‡ into which sugar of lead enters as a principal ingredient, and which is stated to be "truly a good medicament in those consumptions which proceed from ulcers of the lungs."§ Ettmuller, also, employed the sugar of lead internally in this disease. More recently this remedy has been particularly recommended in this affection by Horn,‖ Amelang,¶ Remer, Kopp,** Hildebrand,†† Jahn,‡‡ and others. Ossiander (Entwicklungs Krankheiten, B. ii. p. 141) is

* Paracelsi, Opera Omnia, vol. ii.

† Medical Transactions of the London College of Physicians, vols. i. and ii., 1772.

‡ ℞.—Sacch. saturn. ℥ii;
Sal. martis ℥i;
Inf. spir. vin. ℔i. Dose, from twenty to forty drops.

§ Pharmacopœia Bateana, or Bates's Dispensatory, fourth edition, by William Salmon, M. D., 1693.

‖ Horn's Archiv. für Medicinische Erfahrung, 1812, tom. i.

¶ Hufeland's Journal of Pracktischen Heilkunde, tom. xxii. p. 3.

** Ibid., tom. xi. p. 62.

†† Ibid., tom. viii. No. 4, p. 3.

‡‡ Materia Medica, p. 2.

a zealous advocate for the employment of this article in phthisis. He asserts that, in a great many cases, he derived unequivocal benefit from its employment, and, in some instances, the disease, he affirms, yielded completely to its sanative powers. It is said to be particularly beneficial in cases attended with a copious purulent expectoration; and in that variety of consumption which depends on chronic inflammation of the mucous membrane of the bronchia. Ossiander gave the acetate of lead in union with opium, or with the extract of cicuta. Horn relates the history of a case of phthisis pulmonalis, in which the sugar of lead was given in gradually increased doses until the quantity taken during the day amounted to eighteen grains. The patient's health was, finally, entirely restored by the continued use of this remedy. (Archives f. Med. Erfahr., 1808, B. vii.) Hufeland also employed this article with success in a case of catarrhal consumption; and in addition to the names already mentioned in testimony of its valuable powers in this disease, we may cite, also, those of Greiner (Allgem. Med. Annal., 1811), Kopp, Herschberg (Hufeland's Jour., Bd. xxxi. St. 5); Wolfe (Ibid., Bd. xxxiv.); Amelang (Ibid., Bd. xxii.); Latham (Med. Transact., vol. v. 1815); Wesener (Hufeland's Journ., B. liii.); Fauquier, Lentz, and Weber (Grundzüge d. Consumptions Krank. d. Lunenborg, &c., 1823). I have myself, in a few instances, given it in this disease, and its effects were always manifestly beneficial. It generally lessens both the night sweats and expectoration, and often very considerably relieves the cough. It is especially useful as a palliative in the advanced stage of the complaint, when the patient is harassed by frequent colliquative discharges from the bowels.

To check internal hemorrhages the sugar of lead is undoubtedly the most efficacious remedy we posssess. It was occasionally resorted to in cases of this kind by the older physicians, but its virtues in this respect have only become duly appreciated during the last twenty or thirty years. The efficacy and safety of lead in hemorrhages, rest now upon the evidence of a very extensive experience. Monro, Hill, Reynolds, Barton, Amelang, Williamson, Jahn, Richter, Heberden, and many others have written in favor of its employment in such affections. It appears to be equally applicable to the treatment both of active and passive hemorrhages. When, however, the pulse is full and hard, bleeding is obviously an essential preliminary to the use of the lead. The late Dr. Barton was in the habit of prescribing this remedy in combination with small portions of opium or ipecacuanha. "Seldom," says he, "have I been disappointed in my expectations of benefit from this medicine, which, of all the articles of the materia medica, seems to me to possess the greatest command over the movements of the arterial system."

From my own experience with this remedy, in hemorrhage, I am induced to entertain a very high opinion of its powers. In a single instance only have I known its use to be followed by symptoms of colic, and these readily yielded to a few doses of castor oil and opium.

The sugar of lead has also been recommended in the cure of dysentery and diarrhœa. To this purpose it appears to have been very early applied, as we find it mentioned by several of the older writers—particularly by Ettmuller and Adair, who speak highly of its remedial powers in dysentery. Drs. Moseley and Jackson have also added their testimony in favor of its usefulness, under certain circumstances, in this disease. "In chronic dysentery," says Dr. Jackson, "a solution of sugar of lead, viz. ten grains of the acetate to one drachm of the crystals of tartar, and two parts of boiling water given every three or four hours, to the quantity of two ounces for a dose, gives evident relief on many occasions, and in no instance within my knowledge has any inconvenience arisen from the supposed deleterious effects of the lead.* Moseley employed this substance in the form of enemata, where the tenesmus was inveterate and harassing, attended with frequent discharges of bloody mucus, or purulent matter, and great soreness about the anus.† Dr. Bampfield, another late writer on tropical diseases, states that Dr. Ainslie, at the artillery hospital at the Mount of Madras, showed him cases "where this medicine was said to be strikingly useful." He does not, however, add much in favor of this remedy from his own experience. He says, that during its exhibition animal food should be abstained from.‡ Quite recently, Dr. Harlan, of this city, has published cases illustrative of the efficacy of this medicine in dysentery,§ and he seems to entertain a very high opinion of its powers, as well as an entire conviction of its safety. My own limited experience with this article, in dysentery, has by no means been satisfactory. I have found it in a few instances to produce constipation with a distressing pressing down of the bowels, without affording any relief to the tormina. I have no doubt, however, that cases may occasionally occur in which the sugar of lead will be found advantageous. But, as a general practice, I am not disposed to think favorably of the remedy.

Of the employment of sugar of lead in intermittents I know nothing from my own experience. Some writers of the last century have spoken well of it in this disease, but I suspect that its powers

* Jackson on Febrile Diseases, vol. ii. p. 61.

† Moseley on Tropical Diseases, p. 404, fourth edition.

‡ Practical Treatise on Tropical Dysentery, p. 198. London, 1818.

§ American Medical Recorder, vol. v.

in this respect are not entitled to much attention. In some of the neuroses this article has been found decidedly beneficial. Saxtorph,* Richter,† Ossan,‡ and others employed it with success in epilepsy and hysteria. Dr. Rush,§ also, cured a case of epilepsy with this remedy; and in the New York Medical Repository,‖ I have reported a remarkable case of this disease, in which the sugar of lead proved completely successful. In this case the fits returned regularly about the periods of full moon. I prescribed three grains of the sugar of lead to be taken mornings and evenings, commencing three or four days before the expected return of the paroxysms, and continued it for five days at each period. The medicine was thus taken at five successive periods of full moon, and the patient, who had been affected with the disease upwards of eight years, was permanently cured thereby.

The sugar of lead has also been prescribed in other spasmodic diseases. Kramp, a German writer, cured a case of spasmodic dysphagia by it, and Ettmuller employed it in melancholia, in which, he says, "it is esteemed a specific."¶ It is said, also, to have been given with advantage in tetanus.** Lately this remedy has been highly spoken of in the cure of hooping-cough. I have used it in five or six cases of this disease, and in a few instances it appeared to do some good. Its efficacy in this respect is, however, not sufficiently great to entitle it to much attention, and more especially as its employment can certainly not be said to be without some risk of unpleasant consequences.

The sugar of lead is one of the most useful remedies we possess for the reduction of external phlegmonous inflammation. In ophthalmia it has long been an exceedingly common remedy; and, although applications of this kind are by far too indiscriminately made, it may often be resorted to with great benefit. When the inflammation does not depend on a constitutional cause, and is unaccompanied by much excitement of the general circulation, saturnine collyria will, in general, prove very serviceable. Under opposite circumstances, however, such applications will not only do no good, but almost invariably produce mischief. The use of this remedy has been no less common, as an injection, in gonorrhœa, than in ophthalmia; and it certainly is very often adequate to the removal of the disease.

* Act. Reg. Soc. Med. Hafniensis, vol. iii. 1792.

† Specielle Therapie, vol. vii. p. 266.

‡ Ossan, Dissertatio de saturni usu Medico, maxime interno, 1809.

§ Philadelphia Medical Museum, vol. i. No. 1.

‖ Vol. ii. No. 1, New Series, 1813.

¶ Allen's Synopsis Medicinæ, vol. i. s. 437.

** Burdach, Arzneimittellehre, vol. ii. 241.

The solution of sugar of lead, made into a cold poultice with the crumbs of bread, is also an excellent application in phimosis, hernia humoralis, and swelled inguinal glands. Applied in the same way, it frequently affords great relief in inflamed hemorrhoidal tumors. This remedy has also been much praised by some writers for its effects in erysipelatous inflammation arising from external causes. By others, however, its use in this affection has been condemned; and my own experience has furnished me with no evidence of its usefulness in this respect.

M. Sommi, of Antwerp, has recently published some facts which go to show that the sugar of lead is a valuable remedy for arresting excessive salivation. An ounce of the acetate is to be dissolved in a pint of water, and used repeatedly during the day as a mouth-wash.

The sugar of lead may be given in doses of from half a grain to six grains, according to the nature and urgency of the symptoms for which it is administered. It is frequently given in the form of pills, in combination with opium. In administering this preparation of lead, care must be taken that the patient do not at the same time receive other substances into the stomach which have the power of decomposing it. The sulphates of magnesia and alum, for instance, would decompose the acetate and produce a sulphate of lead, which is entirely insoluble and consequently inert.* Dr. Paris advises, that in taking the sugar of lead the patient should abstain "from all potation except cold water or draughts composed of diluted acetic acid, for at least one hour after the ingestion of the medicine."

The immediate effects of an enormous dose of sugar of lead are, a sweet astringent taste, with a sense of constriction in the throat, pains in the stomach, with retching or vomiting of bloody mucus, bowels constipated or relaxed, with bloody evacuations, fœtid eructations, hiccup, a sense of constriction in the thorax, with difficulty of respiration, great thirst, painful micturition, cramps of the extremities, cold sweats, convulsions, general sinking of the vital powers, and death. To counteract these effects, experience proves that much advantage may be derived from the early use of solutions of Glauber's salts, Epsom salts, and hard water. Orfila says that the liver of sulphur, which has been recommended by some, is pernicious. If the symptoms be not early subdued by these measures, and signs of gastric inflammation come on, the warm bath, fomentations, and leeches to the abdomen, with copious draughts of infusions of linseed or mallows, or of water sweetened with sugar, should be resorted to.†

* Paris's Pharmacologia.

† Orfila's System of Toxicology, vol. i. p. 484.

Formulæ.

℞.—Plumbi acetatis gr. viii;
Aq. distillat. ℥vi;
Syrup. scillæ ℥ss;
Tinct. opii ℥ss;
—— digitalis ʒiss.—M. One ounce of this mixture may be taken three times daily in phthisis pulmonalis.

℞.—Vitel. ovi;
Ol. amygdalar. ʒii;
Mucilag. g. Arab. ℥ss;
Plumbi acetat. gr. iii;
Aq. fœniculi ℥v.—M. Take a tablespoonful every three hours.

℞.—Plumbi acet. gr. vi;
Opii puriss. gr. iii;
Sacch. albi ʒi.—M. Divide into twelve equal parts. Take one three times daily.

℞.—Plumbi acetat. gr. xv;
P. digitalis purp. ℥ss;
G. myrrh,
Bals. peruvian.,
Extract. helenii, āā ʒii.—V. Divide into two hundred pills. Take six or eight pills, three or four times daily.

SULPHAS ZINCI.

The emetic and tonic properties of this article have already been noticed; and to complete its remedial history, it remains, therefore, only to speak of its virtues as an astringent.

In chronic ophthalmia, a weak solution of the sulphate of zinc often produces excellent effects. It is certainly preferable, in such cases, to the acetate of lead, as having, besides its constringing, a greater roborant effect upon the dilated and debilitated capillaries of the inflamed part. As an astringent injection in gonorrhœa, its employment is very common. Its indiscriminate and unguarded use in this disease is, however, by no means to be approbated. It is much too harsh and irritating, and frequently gives rise to injurious consequences, when employed in the acute stage of the affection. When the discharge has assumed the character of gleet, it may generally be used with advantage. In injections for this complaint it is usually united with sugar of lead to which some mucilage and a small portion of laudanum is commonly added.

The sulphate of zinc has been employed with much benefit against opacities of the cornea, and in pterygium or thickening of the conjunctiva. Himly used it with success in tumors of the

sclerotica and cornea, applied in the form of powder mixed with sugar. A solution of it forms an excellent gargle in aphthous affections of the mouth, for which purpose it is highly recommended by Selle, Armstrong, Hertz, and others. A lotion composed of a pint of sage-tea, two ounces of honey, two drachms of the tincture of myrrh, and two scruples of sulphate of zinc, is often peculiarly beneficial in affections of this kind. The sulphate of zinc is a remedy of very considerable powers in chronic cutaneous eruptions. The famous ointment of Jasser consists principally of this article. I have frequently employed it in the form of a lotion in scabies with perfect success.

In obstinate venereal ulcerations, great benefit may often be derived from a lotion composed of two drachms of calcined sulphate of zinc, the same quantity of burned alum dissolved in two ounces of water, with the addition of a drachm of the tincture of galbanum.

This article affords one of the most effectual astringent injections in fluor albus. It may be very advantageously united with alum for this purpose. A drachm of each, dissolved in a pint of water, forms an injection of sufficient strength; but it is proper to observe, that neither this, nor any other application of this kind, can be employed with propriety before the vaginal inflammation has been moderated by low diet, saline purgatives, and injections of warm water, or weak solutions of sugar of lead.

The sulphate of zinc has also been much praised as a remedy for the removal of polypus in the nose. Mursinna asserts, that we possess no application equal to the sulphate of zinc, to prevent the renewed growth of a polypus after it has been extirpated with the knife or forceps. He says, that it seems to possess a specific power in opposing the growth of such tumors, when any of its roots remain after an operation. He recommends the injection of a strong solution of this salt, for several weeks after an operation of this kind. It has also been employed with success as an escharotic, for removing fungous tumors seated in the external meatus of the ear.

Formulæ.

℞.—Sulphat. zinci ℥iss;
Mellis ℥i;
Tinct. myrrh. ℥ii;
Spir. vini gallici ℥iss;
Infus. salviæ ℥viii.—M. An excellent gargle in ulcerated gums, tonsils, &c.

℞.—Pulv. sulph. zinci ℥ii;
Flor. sulphur. ℥iii;
Axung. ℥ii.—M. In itch and other chronic cutaneous affections.

SULPHAS ALUMINÆ.

Alum is an earthy salt, consisting of sulphuric acid and alumina, with a portion of potass, or ammonia, or sometimes of both. "It crystalizes in regular octahedrons, whose sides are equilateral triangles." Its taste is sweetish, rough, and exceedingly astringent. It dissolves in fifteen times its weight of water at 60°, and in three-fourths of its weight at 212°. It is also soluble in alcohol. When exposed to the air it slightly effloresces. "By the action of heat it first undergoes the watery fusion, then loses its water of crystalization, and lastly a great part of its acid," assuming a white, spongy appearance, friable and very light. It is decomposed by the alkalies and alkaline salt, carbonate and muriate of ammonia, carbonate of magnesia, tartrate of potass, lime-water, superacetate of lead, the mercurial salts, "as well as by many vegetable and animal substances, especially galls and kino."* Hence, as Dr. Paris observes, the addition of alum to vegetable astringents is very injudicious.

Alum was well known to the ancients, but it does not appear to have been used by them as an internal remedy. Dioscorides and Hippocrates praised its effects as a lotion, in various kinds of ulcers, and particularly in sores of the mouth, and in spongy swelled gums. Van Helmont, Helvetius, Mead, and Thompson, were among the first who brought its internal use into particular notice.

Lind speaks very highly of the powers of alum given with nutmeg in intermittent fever. He declares that, except the Peruvian bark, it proved more successful in his practice than any other remedy he ever used. Cullen speaks less favorably of it. During the present season, I have prescribed it in four cases combined with nutmeg and serpentaria. One of the patients was cured after using the remedy four or five days. According to Dr. Darwin alum is particularly suited to the cure of fevers attended with disease of the bowels.

Alum is said to be one of the most effectual remedies we possess in colica pictonum. Grashuis was the first who used it in this disease. Richter speaks in the most exalted terms of its effects in this painful and often intractable complaint. The testimony of a great many others, eminent writers, might be adduced in favor of its virtues in this respect.† I have myself prescribed

* Paris's Pharmacologia.

† Sommer, in Hufeland's Journal, d. Pract. Heilk., B. vii. st. i, p. 73. Gebel, ibid., B. viii. st. ii, p. 195. Percival, Observ. and Experiments on the Poison of Lead, p. 71. Lentil Memoral. circa aerem vitæ genus, sanitat, et morbis clausthaliens, p. 125.

this article in several cases, with prompt and conspicuous advantage. In an instance which occurred to me, quite recently, relief was obtained from the alum, after opium, and the most active cathartics had failed to remove the affection. Fifteen grains of the powdered alum are to be given every two or three hours, either by itself or in combination with opium.*

In chronic discharges from the bowels, alum, either alone or in combination with other articles, has been frequently employed with considerable advantage. The alum whey forms an excellent remedy in such cases. I have known the use of powders composed of ten grains of alum, fifteen of calamus aromaticus, and one-fourth of a grain of opium, to arrest a chronic diarrhœa of long standing very promptly, without any disagreeable consequences. Alum has also been successfully employed in internal hemorrhage. Van Helmont gave it with much success in uterine hemorrhages; and Cullen states that he found it serviceable in bleedings from the uterus, but not in those from the lungs. This, he thinks, was owing to the latter variety of hemorrhage being almost invariably of the active kind. In protracted sanguineous discharges from the uterus, connected with great relaxation of the solids, alum is undoubtedly a very valuable remedy. In cases of this kind it is very advantageously administered in combination with Peruvian bark. Where the pulse is active it ought not to be given without previous depletion. Leake used a solution of this substance in the form of an injection in this variety of hemorrhage. Alum has also been much extolled for its remedial powers in leucorrhœa; and, employed as an injection in this disease, it is certainly capable of doing considerable good. I have prescribed it occasionally in this way, though seldom with decided advantage. Where this disease is attended with great relaxation of the general system, or with that habit of body which has been denominated leuco-phlegmatic, alum, combined with the rust of iron, is said to be peculiarly beneficial, as an internal remedy. I have also used the alum in union with ipecacuanha, with much advantage in this complaint. From six to ten grains of the former, to four or five grains of the latter, may be given twice or three times daily. Dr. Dewees states that he has used the alum in combination with nitre in leucorrhœa, with complete success in several very obstinate cases.

Diabetes is another disease in which alum has been successfully used. Its employment in this complaint was particularly recommended by the celebrated Dr. Mead, and by Dover. Selle, also, states that he cured an obstinate case by giving the patient

* Richter's Specielle Therapie, B. iv. p. 201.

thirty grains of alum three times daily.* The majority, however, of those who have tried the alum in this disease, do not speak favorably of its powers; and it does not, at present, enjoy any particular reputation in this respect. Used as an auxiliary to other measures, the alum whey may, no doubt, often be serviceable. As a principal remedy, however, it is certainly not to be relied on. The alum has also been recommended in flatulent colic, gastric debility, and in colliquative sweats, &c.

I have known very decided benefit to result from the internal use of a mixture of alum and the nitrate of potass in erysipelas and other forms of local inflammation tending to gangrene. Three grains of the former with ten of the latter article, should be given every two hours.

Alum has likewise been recommended as a useful remedy in morbid dilatation of the cavities of the head. Professor Dzonde speaks particularly in favor of its powers in cardiac affections of this kind. (Aeskulap., Bd. i. 1821.) He states that he has derived unquestionable benefit in habitual palpitations of the heart, from morbid dilatation, from a solution of two drachms of alum in six ounces of water, given in doses of a tablespoonful, five or six times daily. Sundelin (Arzneimittell., B. ii. p. 244), also asserts, that he has used this article with great advantage in a case of this kind. As an external application, alum may be advantageously employed in a variety of complaints. In relaxations of the uvula and cynanche tonsillaris much benefit may often be derived from the use of gargles containing alum. "In many persons," says Dr. Cullen, "who are liable to be affected with swellings of the tonsils, we have known the disease prevented, or soon removed, by a decoction of oak bark, to a pound of which a half a drachm of alum and two ounces of brandy were added."†

Bretonneau has recently published a statement which goes to show that alum may be very beneficially used as a local remedy in croup, more especially in that variety of the disease, which commences by inflammation in the fauces, and the formation of pseudo-membranous structure on the tonsils, &c. His mode of using it is to blow some finely powdered alum, through a small tube, into the fauces. When thus applied it is said that this substance often speedily arrests the further progress of the malady.

To arrest the bleeding of leech-bites, on parts where compression cannot well be made, a solution of alum or powdered alum applied to the part, will in general answer better than any other application.

In ophthalmia, after the inflammation has been somewhat sub-

* Beitraege zur Natur. and Arznei., &c., B. i.

† Mat. Med., vol. ii. p. 12.

dued by local and general depletory measures, or in the chronic form of the complaint, the alum curd,* as it is called, will, in general, prove very serviceable. Cullen states that he has found the solution of alum, in the proportion of five grains to the ounce of water, still more effectual than the coagulum aluminosum. In the beginning of acute ophthalmia, these applications will very generally prove hurtful. Alum has also been used as an injection in gonorrhœa. In gleet it may be useful, but in recent gonorrhœa it is much too harsh and irritating, and ought never to be employed.

CALX.

As a mild astringent, lime-water is a remedy of very considerable utility. In the advanced periods of dysentery, diarrhœa, and in cholera infantum, it often produces excellent effects. In the chronic form of the latter disease, I have been in the habit of prescribing it in union with a weak infusion of cinchona, and it has, very generally, appeared to me to be of service. Where there is acidity in the primæ viæ, attended with vomiting or diarrhœa, the lime-water is doubly indicated. In such cases, it at once corrects the vitiated contents, and allays the morbid irritability of the stomach and bowels. It is, indeed, one of our most useful remedies to check inordinate vomiting. For this purpose it is usually administered with milk, given in doses of a tablespoonful of each every twenty or thirty minutes. Under the head of Antacids, I have already noticed its utility in dyspeptic cases attended with acidity of the primæ viæ.

Hoffmann asserts that lime-water is the most effectual remedy we possess in scurvy arising from the continued use of salted provisions. This, however, is not confirmed by the experience of others.†

As an external remedy, lime-water may often be advantageously used in old fungous ulcers, attended with inordinate discharges of a serous matter. It has also been recommended as affording great relief from the pain and fetor of malignant ulcers. It is even asserted to have been used with success in genuine cancer. Baumbach, a German writer, relates two cases of cancerous ulcerations of the lips and breast, which, he says, were

* This is made by rubbing a piece of alum with the white of eggs on a plate until a coagulum is formed. It is applied to the eye between two pieces of fine linen.

† Burdach, Arzneimittellehre, B. iii. p. 500.

effectually cured by the internal and external use of lime-water.* In the cure of porrigo larvalis, or crusta lactea, lime-water, used both externally and internally, is recommended by Barlow, Dreiszig, and Wichmann,† as an efficacious remedy. Hufeland recommends a liniment made of equal parts of lime-water and sweet oil, as one of the most effectual applications in herpes.‡ This liniment, with the addition of a portion of laudanum, is also a very excellent application in burns and scalds. I have repeatedly seen its virtues in this respect exemplified.

Chloride of Lime.—This is one of the most powerful disinfecting agents we possess, and in consequence of its valuable properties in this respect, has of late years become a highly important substance "in its application to medical police." It possesses the property of arresting or preventing putrefactive decomposition, and of destroying or neutralizing the foul and pestilential effluvia which proceeds from decaying and putrefying animal and vegetable matter. "It is employed for disinfecting dissecting-rooms, privies, common sewers, docks, and other places which exhale offensive effluvia. In destroying contagion and infection, it is also highly useful. Hence hospitals, alms-houses, jails, ships, &c., may be purified by its means. In short, all places, which may be deemed infectious, from having been the receptacle of cases of virulent disease, may be more or less completely disinfected by its use, after they have undergone the ordinary processes of cleansing."

The chloride of lime has also been strongly recommended, as an application to ill-conditioned ulcers, burns, cutaneous eruptions, and certain forms of ophthalmia. When applied to foul and offensive ulcers, it not only completely destroys their fetor, but in general greatly improves their appearance and condition. From one to four ounces of the chloride, dissolved in a pint of water, "forms a solution within the limits of strength ordinarily required for this purpose." The best mode of using it, is to saturate lint with the solution, and apply it to the ulcer. In *purulent ophthalmia*, much benefit may sometimes be obtained from a solution of this salt, employed as a collyrium. Mr. Varlez, a surgeon of the Military Hospital at Brussels, and Mr. Gutherie, regard this solution as the best astringent application we possess in this variety of ophthalmia. Mr. Varlez declares that he has employed this collyrium in more than four hundred cases of this complaint, and invariably with marked benefit. After the local

* Vogel, resp. Baumbach. Diss. de curatione cancri occulti et aperti per aquam calcis vivæ potam præstita.

† Ideen Von Diagnostic, B. i. p. 50.

‡ Journal der Practischen Heilkunde, B. xxiii. st. 3. p. 209.

and general inflammatory excitement has been moderated by depletory measures, a solution of this salt, in the proportion of a scruple to an ounce of water, should be applied to the inflamed conjunctiva. If the inflammation does not subside, and the patient bears the application of the solution without complaining, its strength may be increased to one, two, or even three drachms of the salt in the same quantity (an ounce) of water. In the purulent ophthalmia of infants, I have, in several cases, used this remedy, in the proportion of ten grains of the chloride to an ounce of water with great advantage. A small portion of it should be carefully injected under the eyelids, two or three times daily. In that singular gangrenous pustule of the lips peculiar to children, called *noma*, or *aquatic cancer*, the local application of the chloride of lime has been found signally beneficial. A case of this affection is related in a late number of Hufeland's Journal, by Mr. Berndt, which, "in the course of eight days, was entirely cured by this application." A paste was made with the chloride and a small portion of water, and applied to the lip of the child, every two hours during the day. In proportion as the disease yielded, the remedy was less frequently used.

Dr. Gubian, of Lyons, asserts, that if the pustules of small-pox, about the ninth or tenth day, when in full suppuration, be punctured, and afterwards washed several times daily, with a weak solution of the chloride of lime, the drying will be rapid, and the pocks leave no marks or cicatrices. (Journ. de Chimie Médicale, Mai, 1830.)

Dr. Graefe, of Berlin, has recently employed this remedy internally, with entire success in *gonorrhœa*. He administered it in the form of an emulsion, composed of a drachm of chloride of lime, seven ounces of almond emulsion, and an ounce of syrup. "The dose of this mixture is a tablespoonful, containing about four grains of the chloride, to be repeated every three hours. Three or four portions are usually sufficient to effect a cure. The medicine, at first, usually excites an increased flow of urine, with irritation of the urethra; but these symptoms soon disappear, and the discharge diminishes with them." (Rev. Médicale, July, 1830.)

Liquor calcis muriatis, or muriate of lime. (Pharm. U. States.) This preparation of lime was formerly much extolled for its efficacy in scrofulous affections. Fourcroy, Beddoes and Hufeland have published very favorable accounts of its effects in this disease. It was particularly recommended as an internal remedy in ulcerations, and ophthalmia of a scrofulous character. I have employed it in affections of this kind, but never obtained any obvious advantage from its use.

BARYTES.

The only preparation of barytes employed in medicine, is the muriate. This salt has a bitter and pungent saline taste. Given in a moderate dose, it does not manifest any sensible operation. An inordinate dose, however, excites nausea, vomiting, and sometimes anxiety, palpitation and vertigo. Hufeland states that he has known this medicine to produce a continued feeling of distressful anxiety for several days, without any other obvious effect. It often occasions, when first used, and especially in patients who have worms, slight griping pains, with diarrhœa. It generally keeps the bowels somewhat relaxed. It has no perceptible effect upon the pulse. Hufeland says, that it appeared to him rather to retard than accelerate it. The excretory organs are more obviously influenced by this remedy. It generally augments the urine and cutaneous exhalation. Applied to the skin, it produces a smarting, burning pain, and when concentrated, it proves escharotic.*

The muriate of barytes, or, as it was formerly called, terra ponderosa, was first introduced to the notice of the profession, by Dr. Crawford,† of England, as a remedy of great powers in scrofulous affections. This writer assures us, that he has found it successful in many of the most confirmed cases of scrofula. Mr. Pearson, and Drs. Clark and Hamilton, have published observations confirming Dr. Crawford's statements upon this subject. In Germany and France, this remedy has found a number of able advocates. Goering, Fourcroy, J. A. Schmidt, Peterman, and especially Hufeland, have published statements illustrative of its beneficial effects in affections of this kind. It cannot, indeed, be doubted, that it has been found useful in this disease; but later experiments with it, in this country as well as in Europe, do not justify the high praises that have been bestowed on it. Ferriar, Kretschmar, Fleisch, Henke, Richter, &c., employed it in large and continued doses, without deriving the least advantage from it.‡ Some writers, among whom are Girtanner and Arnemann, have represented it as frequently productive of highly injurious and even poisonous effects.

In a single instance of violent and obstinate scrofulous ophthalmia in a child, I prescribed the solution of this substance, and had the satisfaction to see my patient get well under its use. In

* Hufeland, Darstellung der Medicinischen Kräfte der Salzsauren Schwererde, p. 15.

† Duncan's Medical Commentaries, vol. iv. Dec. 2, p. 433.

‡ Richter's Specielle Therapie, vol. v. p. 623.

employing this medicine, it is necessary to continue its use for a long time. In very tedious cases, Hufeland observes, its use should be interrupted every eight or fourteen days, and a purgative interposed. This remedy is said to be most useful when there is an inflammatory and very irritated condition of the lymphatic system present, or where the bowels are loaded with irritating and bilious matters. It is especially efficacious when the disease appears in the form of cutaneous eruptions. In cases attended with great relaxation and weakness, or where symptoms of hectic are present, it seldom does any good, and often harm. Nor can it be used with benefit in cases complicated with scorbutic affections.*

The muriate of barytes has also been used with advantage in herpetic eruptions, scabies, porrigo, scirrhus, amenorrhœa, and mania; successful examples of all of which are mentioned by Hufeland and others.

The dose of this remedy is from ten to fifty drops every three hours, of a solution of one drachm in an ounce of distilled water. It should always be commenced with in a small dose, and gradually augmented.

The sulphuric and nitric acid, the alkalies, magnesia, tartarized antimony, burned sponge, and flowers of sulphur decompose it. Antimonial wine renders it slightly turbid, but does not entirely decompose it. It may be given with vegetable extracts and syrups, and decoctions, alcohol, corrosive sublimate, arsenic, without having its compositions affected.

ACIDUM NITRICUM.

The nitric acid has, within the last twenty or thirty years, become an article of very considerable importance in therapeutics. M. Alyon, a French physician, introduced it to the notice of the profession as an exceedingly valuable remedy in syphilis. He published a number of cases illustrative of its efficacy in this disease; and it was soon afterwards tried by several eminent English physicians, whose reports on its effects were very favorable. Cruickshank, Scott, Sandford and Hammick published observations tending to confirm its character as an efficacious anti-syphilitic remedy. But no one was more extravagant in its praise than Beddoes.‡ As is usual, however, with new remedies, it did not long sustain the reputation it at first acquired. The result of the experience of the profession on this subject is—that in old cases

* Hufeland, op. cit.

† On the Effects of Nitrous Acid, &c., 1797.

of syphilis, connected with a cachectic condition of the system, the nitric acid is capable of mitigating the disease, but is inadequate to a perfect cure. In cases of this kind, and especially when symptoms of scurvy are complicated with it, much benefit may commonly be derived from the alternate employment of the acid, and mercurial remedies. Where mercury fails to remove the symptoms entirely, and rheumatic pains, nodes, ulcers, &c., remain, the acid will sometimes prove highly serviceable. It is seldom sufficient to prevent the occurrence of secondary symptoms; though it will often remove them after they have made their appearance.

The nitric acid has been recommended as a very useful medicine in chronic hepatitis, as well as in scrofulous ulcerations. I have used it in some cases of the former disease with advantage; but I have not known it to perform a perfect cure. This acid has also been recommended in dysentery and diarrhœa, but its use in this way does not appear to merit much consideration.

This acid may also be beneficially used as an external application to syphilitic ulcers,* and in certain chronic cutaneous eruptions.† Plenk recommends an ointment made of nitric acid and ung. althæa, of each half an ounce, and two drachms of ung. juniperi applied twice a day, as highly efficacious in tinea capitis. The nitric acid may be taken from one to two drachms daily, diluted in a quart of water, to which six or seven ounces of syrup are added. Its use increases the appetite, accelerates the pulse, augments the secretion of urine and saliva, and when long continued, produces a tenderness of the gums.‡

The nitro-muriatic acid has lately attracted very considerable attention, both as an external and an internal remedy. Dr. N. Scott was the first who noticed the superior remedial powers of this mixed acid.§ It appears to have a very particular tendency to act upon the glandular system, and especially to excite the secretory action of the liver and cutaneous exhalants. "As a very general rule for its employment," 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." It is inad-

* This is said to be an excellent ointment for purposes of this kind; ℞. Acid nitric. concentr. ʒi; pingued. vacc. ℥i; misce int. sub leni igne, et adde, opii puriss. ʒi; fiat unguentum.

† Alyon, Essai sur les Propriétés Médicinales d'Oxygene, 1791.

‡ Richter's Specielle Therapie, vol. v. p. 321.

§ Beddoes' Contributions.

missible in acute diseases. It is especially recommended in chronic hepatitis and in functional disorders of the liver. In these diseases Dr. Scott considers it as the most effectual and the safest remedy. It is said, likewise to be very efficacious in syphilitic and pseudo-syphilitic affections. Dr. James Johnson, who appears to place considerable reliance on the nitro-muriatic bath in the treatment of chronic hepatitis, gives the following directions for preparing and 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 the nitric acid of the London Pharmacopœia, and four ounces of muriatic acid. One ounce of this mixture to a gallon of warm water will form a bath of medium strength, and such as Mr. Astley Cooper commonly prescribes. The proportion may be increased to one ounce and a half, or diminished to half an ounce of the solution to the gallon of water, according to the age, strength, delicacy, or other peculiarity of the patient. The feet and legs of the patient ought to be immersed in this bath at a comfortable warm temperature, say 96°, and kept there twenty minutes or half an hour, just before going to bed. This may be done every night or every second night, and the same bath will remain good for five or six nights."*

It is proper to observe, however, that several very respectable physicians, who have published the result of their experience with the nitro-muriatic acid bath, have not found it to answer the expectations which were excited by the publications of Dr. Scott and others. Mr. Guthrie, deputy-inspector of military hospitals, states, as the result of his experience with this remedy, that it is of very uncertain operation, and that no dependence can be placed on it. He does not, however, contend that the remedy is entirely destitute of useful powers. "It seems often," he says, "not to produce any effects whatever, however extensive its application: and yet the complaint for which it has been used shall slowly subside or disappear, whilst in other instances it remains stationary or gets worse."† From my own experience I know very little of this remedy. I have employed it in a few instances of functional derangement of the liver; but as it was alternated with mercurial remedies, I am not able to say how much of the beneficial result is to be ascribed to its operation. It appears to be beyond a doubt, however, that it is possessed of very useful remedial powers. But no one will now pretend to say that it approaches mercury in any of the diseases in which it has been recommended. It may, nevertheless, be sometimes usefully substituted for mercury, where this article cannot be given on account of idiosyncrasy, debility,

* On the Influence of Tropical Climates.

† Medico-Chirurgical Transactions, vol. viii. for 1817.

or other causes. It may even occasionally happen to prove effectual where mercury has done no good, or has been hurtful. This has been observed of a variety of articles whose remedial powers are in no respect equal to this metal.

ACIDUM SULPHURICUM.

The sulphuric acid is a medicinal agent of very considerable importance. By the German physicians this acid is very frequently prescribed in hemorrhages; and some of the older English writers recommend it very highly for its powers in such cases. Sydenham especially considered it as a remedy of great use in hemorrhage; at present it is only prescribed as an auxiliary, after the immediate violence of discharge has been restrained by more active measures. In spitting of blood, and in slight, but protracted bleedings from the uterus, it often answers very good purposes. As a tonic this acid is very frequently administered. It seems to be particularly adapted to invigorate the digestive organs during convalescence from febrile diseases. Sometimes, however, it will produce unpleasant affections of the stomach, such as pains and nausea. When this occurs, it must, of course, be at once discontinued.

The sulphuric acid is a very efficacious remedy in certain chronic eruptive diseases. The use of it in this way originated, I believe, in Germany. Dr. Cothenius, principal physician of the Prussian army, employed it for the cure of the itch, in 1756. It has, since that time, been employed and commended by many of the most eminent physicians of Europe. Crollius, Tissot, Baldinger, Hafenreffer, Gahn, Richter, and a number of other writers, have mentioned its virtues in this respect. Richter observes, that the external application of this acid, diluted with water, is perhaps the most useful of all our remedies in itch complicated with a scorbutic habit of body.* Dr. Kinglake, also, has found this acid very effectual in cases of this kind.† Dr. Fosbroke, of Berkeley, in England, has recently published a paper on the use of diluted sulphuric acid in cutaneous affections, in which he relates several very striking examples of its efficacy. He prescribed it in an obstinate case of lichen agrius, with prompt success. It was taken in a decoction of elm bark and of the wood of solanum dulcamara, "using, at the same time as a wash, a decoction of the deadly nightshade."‡ It should be taken in as large doses as the

* Specielle Therapie, tom. vi. p. 179.

† London Med. and Phys. Journ., 1801, p. 614.

‡ London Medical and Physical Journal, for July, 1822, vol. xlvii. p. 483.

stomach will bear; from one to four drachms, properly diluted, may be taken in twenty-four hours. It is usually employed in the form of the acidum sulphuricum aromaticum, or elixir of vitriol. Made into an ointment with lard, it forms a very efficacious application in diseases of this kind. In this way I have repeatedly employed it with prompt success in the itch. I have also cured a distressing case of prurigo formicans, by the external and internal use of this remedy alone. The ointment is made by simply incorporating the acid with lard, in the proportion of about thirty drops to an ounce of the latter.

Quite recently I have been informed by Dr. J. R. Lucas, of Brunswick, Virginia, that the sulphuric acid, properly diluted, forms an exceedingly efficacious injection in gonorrhœa.* I have tried it in one instance with success. About eight drops of the acid should be mixed with eight ounces of water, when used for this purpose.

* American Medical Recorder, for October, 1822.

CHAPTER VIII.

MEDICINES WHOSE ACTION IS PRINCIPALLY DIRECTED TO THE UTERINE SYSTEM.

I. *Medicines that promote the Menstrual Discharge.*

EMMENAGOGUES.

Under this class are arranged such remedies as are supposed to be capable of promoting the menstrual discharge. It is very doubtful, however, whether any of the articles which have hitherto been employed for this purpose, possess any direct influence over the uterine secretions. We know, at least, that their emmenagogue effects are very uncertain; and that remedies of the most opposite character do occasionally, under peculiar circumstances, produce such effects.

That the menstrual discharge is a secretion, and not a mere effusion of blood from the extremities of the uterine vessels, is an opinion now pretty generally entertained. This opinion is distinctly expressed by Allen, in a quotation from an author whom he does not mention. "I dare assert," says he, "that the menses proceed entirely from the superfluous chyle concocted into a viscid humor, which by degrees mixes with the mass of blood, and, as is well known of all the several other secretions, is separated *by the glands situated there for that very purpose*, as manifestly appears on the dissection of those parts. The menses are considerably more viscid and thick than the rest of the blood, and have generally an ungrateful and unusual smell, very different from what is drawn off by bleeding, or flows from an hemorrhage."* Bordeu, too, in his invaluable Treatise on the Glands,† advances the same opinion.

Whatever opinion we may adopt in relation to the nature of

* Synopsis Medicinæ, vol. ii. p. 232.

† Traité des Glands.

this evacuation, certain it is, that whenever it becomes irregular or suppressed, the health always suffers more or less disturbance. Even the peculiar destiny of the sex—the noble prerogative of becoming mothers, is destroyed, and with it, often the tenderest hope of the female.

I have already said that it does not appear probable that any of our emmenagogues exert any direct action upon the uterus. If this were the case, we might, I think, calculate, with much more certainty, on the operation of these remedies, than experience teaches us to do. If we attend particularly to the effects of these articles, we discover that many of them have a decided tendency to increase the flow of blood to the pelvic viscera generally. This is also the case with some other means occasionally resorted to for the restoration of obstructed catamenia, and which cannot be properly placed under the head of emmenagogues. Thus ligatures on the thighs, the semicupium, and fomentations to the external parts of generation, can only act by creating a local plethora in the vessels of the pelvic viscera, and consequently of the uterus. I have known the extirpation of large hemorrhoidal tumors to restore suppressed catamenia, by which the local drain of blood from these parts was removed, and the ordinary fullness of the uterine vessels re-established. It is not necessary that we should regard the menstrual discharge as a mere effusion of blood, arising from local uterine plethora, in order to admit this explanation of the modus operandi of emmenagogues. The phenomena are perfectly compatible with our notions of the secreted nature of the menstrual discharge. There is an intimate relation between the degree of exaltation in the vital properties of a part, and the quantity of blood circulating through it. We find, accordingly, that whatever increases the flow of blood to a gland, increases also its secretion. It is in this way, perhaps, that all irritations increase the peculiar secretions of the organs to which they are applied. They produce an immediate flow of blood to the organs irritated, the vital properties of which are thereby elevated, and a larger secretion of their peculiar fluid takes place.

We can, therefore, readily understand how an increased determination of blood to the pelvic viscera may very often remove torpor in the uterine vessels, and thus restore the suppressed catamenia. Although emmenagogues are a class of remedies expressly set apart as means for removing catamenial obstruction, they yet, in reality, constitute but a small portion of our remedial resources in such cases. In a very great number of instances we find it necessary to have recourse to general remedies, to the exclusion of such articles as are technically denominated emmenagogues. If, for example, the catamenia cease to flow in con-

sequence of a general relaxation or debility of the system, our best curative means, of course, are such as invigorate the vital powers. Hence, tonics, exercise, the cold bath, an invigorating diet, &c., do occasionally produce the best effects in cases of obstructed menstruation. A suppression of the menses is also frequently attended by a state of the system directly the reverse of that of debility and relaxation. There is a rigidity of fibre unfavorable to the regular performance of some of the organic functions; the habit is full and inflammatory, and though apparently vigorous, easily subdued by any unusual exertion. In cases of this kind, all the stimulating emmenagogues would, without the use of previous depletory measures, not only be ineffectual, but injurious. Bleeding, a temperate diet, tepid bath, &c., are here the proper remedies; and they often restore the regular evacuation of the catamenia, in a prompt and effectual manner.

In prescribing, therefore, for suppression of the menses, it is of the utmost consequence that we attend to the general state of the system. Without such attention, indeed, our success must not only be extremely precarious, but our remedies very often increase the mischief we are called upon to remedy.

Alibert justly observes, that there are few disorders which depend on such a variety of causes, or are connected with such different conditions of the general system, as obstructed catamenia. Hence, its remedies are so various, and often of such contrary character; and hence, too, the great uncertainty of all our remedial measures in such cases.

RADIX HELLEBORI NIGRI.

The plant which furnishes this article is indigenous to the Austrian Alps, the Apennines, and the Pyrenees. The root, which is the only part employed in medicine, consists of numerous black fibres, springing from knotty branches, which issue out of a central radical tuber. Its taste is acrid, bitter, and nauseous, and, when chewed, it imparts a benumbed feeling to the tongue.*

* The root of black hellebore is not unfrequently adulterated by other roots, some of which are powerfully poisonous. The roots of the adonis vernalis, trollius Europæus actæ spicata, astrantia major helleborus fœtidus, veratrum album, and aconitum neomontanum, are occasionally mixed with, or entirely substituted for it. The root of the adonis vernalis may be distinguished from that of the black hellebore by the fibres not issuing from branches, but immediately springing from a central tuber; they are also more numerous and more fleshy, externally darker and internally whiter than those of the hellebore.

Water and alcohol draw from it a bitter and acrid extract. According to the analysis of Vauquelin, its constituent principles are, a very acrid essential oil, a small portion of extractive matter, fecula, a vegeto-animal substance, and salts.

Geise considered the acrid oleo-ethereal fluid as a peculiar principle, to which he gave the name of *helleborinum*. According to Pfaff, however, this substance approaches more to the character of a resin than to an essential oil. It is best extracted by alcohol, and is distinguished by its leaving an exceedingly acrid taste in the back part of the mouth and fauces when chewed.*

The root loses its active properties by age. Its fibrous are much more powerful than its knotty or tuberous parts.

This is one of the most ancient articles of the materia medica. Ctesias, who lived in the time of Plato, and anterior to Hippocrates, speaks of it as a medicine of important virtues. It was particularly celebrated with the Greek and Roman physicians, as a remedy in mania. The extraordinary cures performed at the island of Anticyrus, famous for its hellebore, are celebrated by the poets and historians of antiquity. The doses which the ancients employed were, however, much larger than we would venture upon at the present day; and its effects, accordingly, were often excessively violent. It appears, indeed, by the accounts which have reached us of the employment of this article among the ancients, that they never expected to cure, without producing with it, symptoms of a very violent character. Hence Oribasius, in his treatise on the use of hellebore, has two chapters entitled, "Quæ faciendum sit quum strangulatio occupat eos qui Elleborum sumpserunt," and "Quæ faciendum sit ubi vox et sensus amittitur."†

When given to animals in large doses, hellebore produces the following effects: Slow and difficult respiration; slowness and sometimes irregularity of pulse; vomiting of mucous and bilious matter; an increased flow of saliva; trembling and unsteadiness; vertigo; convulsions followed by tetanus, and diminution of heat. The animal finally becomes cold, respires after long intervals, and

The principal root of helleboris fœtidus is thin, not knotty, nearly straight, with fewer fibres, which are short, very black, and much more acrid than those of helleborus niger. The root of actæa spicata is spindle-shaped, jointed, yellow within, with woody fibres. Trollius Europæus has a very short radical tuber, with branched fibres, which have neither taste nor smell when dry. The root of astrantia major is articulated, spindle-formed, and slightly acrid. That of aconitum napellus is roundish, spindle-shaped.

* Pfaff's Mat. Med., tom. iii. p. 253.

† Medical Sketches, by G. Kerr, p. 22.

dies.* From a variety of experiments performed by M. Orfila on dogs, he concludes:—1. That powdered hellebore applied to the cellular texture, is rapidly absorbed into the circulation. 2. That its local effects are confined to the production of slight inflammation. 3. That "the part which is soluble in water, is that in which the poisonous property of the hellebore resides." 4. That the alkaline extract of black hellebore, which forms part of Bacher's tonic pills, is also extremely active.†

When taken into the human stomach, it manifestly increases the force and rapidity of the circulation, and excites a sensation of warmth throughout the whole body. When taken in large and repeated doses, its effects are often, as I have already stated, very violent. Independent of the powerful vomiting and purging which this article is known sometimes to produce, its long use occasions a singular feeling of coldness in the abdomen, muscular debility, anxiety about the heart, slow and small pulse, headache, stiffness of the muscles of the neck, pain in the glands about the throat, slimy, whitish mucous discharges from the bowels, spasms, delirium, hemorrhages, &c.‡

The emmenagogue virtues of this article remained unnoticed until the celebrated Mead announced them to the public. As is usual with those who introduce new remedies, he lavished the most extravagant encomiums on the emmenagogue powers of this substance. On the continent of Europe, especially with the Germans, this remedy stands in no small repute. But in England, as well as in this country, the authority of Cullen, who regarded it as nearly inert in this way, has thrown it into unmerited neglect.

It seems to me quite certain, however, that both Mead and Cullen were wrong in their estimates of the powers of this medicine, and that it is entitled neither to the extravagant praises of the one, nor the unqualified condemnation of the other. Indeed, within a few years past, its reputation as an article of the materia medica seems to be again advancing.

Hellebore appears to possess a very considerable tendency to determine the circulation to the hypogastric and pelvic viscera. This is evinced by the sense of weight and pain, which patients

* A Memoir upon the Effects of Helleborus Niger and Albus, by M. Schabel of Weissenburg, read in Sept. 1818, to the Society of Emulation, of Paris.

† System of Toxicology, by M. P. Orfila, M. D., translated by J. G. Nancrede, p. 208.

‡ Buchner de salutarii et noxio Ellebori Nigri usu. Halæ, 1748. Burdach's System der Arzneimittellehre, vol. iii. p. 124. Hartman de virtute Hellebori Nigri.

generally experience after having taken it for some days; I have known this determination to be so great as to produce a profuse hemorrhage from the uterus.

From its stimulant properties, one would be led to regard it as inapplicable to cases where there is a fullness of habit, or in a sanguine constitution. Yet Mead, Lewis, and other eminent writers say, that it is precisely in such cases that its emmenagogue virtues are most conspicuous. Burdach, however, in his excellent work on the materia medica, asserts that it is particularly valuable in cases of torpor, where the face is pale and leucophlegmatic, and the pulse soft. To this latter opinion I am inclined myself; at least, my own experience goes directly in favor of it, independently of the theoretical considerations which point that way.

In a recent work on the materia medica,* it is stated that it is especially useful as an emmenagogue when it purges, in cases attended with torpor and constipation of the bowels, and, "perhaps with a degree of insensibility of the uterus." My own experience, however, leads me to a contrary conclusion. It does not appear to me that its cathartic effects are, under any circumstances, necessary, or even accessory to the attainment of its emmenagogue results. I have been much in the habit of employing this article in amenorrhœa, and it has always appeared to me, that, whenever it purged freely, as it generally does when it purges at all, it was less apt to evince the desired effects. If, indeed, its emmenagogue powers depend upon its tendency to produce a local plethora in the uterine system, we can easily imagine how an active catharsis should lessen these effects.

It may be exhibited in substance, or in the form of extract, infusion, or tincture. The extract is given in the dose of from six to ten grains. The tincture is most commonly employed; its dose is from twenty to forty drops two or three times a day, in a cup of some aromatic tea, such as rosemary, pennyroyal, &c. Bacher's pills answer extremely well. They are composed of equal parts of the extract of hellebore, myrrh, with a small portion of carduus benedictus.

Given as an hydragogue, these pills have been taken to the extent of thirty a day, in three doses of ten each, at the distance of an hour between every dose. Taken in this way they produce very copious evacuations by stool and urine. "During their use the patients must be enjoined to drink plentifully of mild liquids. Upon a due attention to this circumstance, viz., dilution, the success of the remedy as an hydragogue in a great measure depends."

* Elements of Therapeutics, &c., by Dr. N. Chapman.

Formulæ.

BACHER'S PILLS.

℞.—Extract. hellebori nigr.,
Extract. myrrh. aq. āā ʒi;
Pulv. card. bened. ʒiii.—M. ft. Divide into one grain pills.

℞.—Tinct. hellebori nigr. ʒi;
—— aloes soccot. ʒss;
—— opii ʒi.—M. Dose, a teaspoonful three times daily.

℞.—Tinct. hellebori nigr.,
—— secale cornut., āā ʒss.—M. Dose, a teaspoonful three times daily.

℞.—Extract. hellebori nigr.,
——— sabinæ āā ʒi;
——— aloes soccot. ʒss.—M. Divide into three grain pills. Take one twice daily.

JUNIPERUS SABINA.

Savin is a small evergreen tree, of the cedar species, indigenous to Italy, Portugal, and Switzerland, where it grows in elevated situations in considerable abundance. It is cultivated with us in gardens, and is, perhaps, of all other articles of this class, the most commonly known for its emmenagogue virtues.

Its leaves contain a large portion of a very pungent essential oil, to which the medicinal virtues of the plant may be fairly ascribed.

When taken internally it powerfully excites the vascular system. It produces a manifest flow of blood to the uterine system; and, when taken in large doses, occasions great heat, agitation, hemorrhage, and inflammation of the bowels.

The testimony of Dr. Home, of Edinburgh, is strong in favor of the emmenagogue powers of this plant; and until the time of Cullen, it was very generally regarded as one of the most potent articles of this class of remedies. By this writer, however, whose authority, though great on all subjects, has, perhaps, often been too implicitly received, the reputed emmenagogue virtues of this substance were considered as unimportant. It therefore soon fell into general disrepute both in England and in this country.

When amenorrhœa depends on a relaxed state of the general system, or on an active and torpid condition of the uterine system, the savin may be often very advantageously employed.* It need hardly be observed, that its great stimulant properties render

* Bayler über die heilkraft. der sabina. Burdach's Arzneimittellehre, vol. iii. p. 300.

it inapplicable in cases attended with a high degree of phlogistic diathesis.

Wedekind,* a German writer of great respectability, says, that this article may be applied with very great advantage in the treatment of that atonic, or relaxed state of the uterus, attended with an unnatural secretion and soft swelling of this organ, which is sometimes met with in women of advanced age, who have suffered much from repeated child-bearing or abortions, and which is generally attended with a train of hysteric disturbances.

I have occasionally employed this article in cases of amenorrhœa, in females of a relaxed habit of body; and though sometimes without success, I have had sufficient evidence of its powers in this way to establish, in my opinion, its just claims to our attention.

Savin has been employed in various other affections, in some of which its remedial powers seem to be very considerable. Rave, a German writer of respectability, speaks in the highest terms of its use in chronic rheumatism.† I have employed this remedy for more than ten years past, in this disease, and I can truly say that its good effects have, in my practice, often been surprisingly prompt and decisive.

Savin, according to some writers, possesses active anthelmintic powers.‡ From my own experience I can say nothing of its virtues in this respect.

Werlhof speaks well of this article in caries of the bones. It has also been much extolled by some German writers for its remedial powers when applied to old and obstinate ulcers, either in the form of decoction or of poultice. As an escharotic application to venereal warts and other fungous excrescences, the powdered savin is not unfrequently employed. And an ointment made of it is one of the most excellent applications we possess for keeping up a discharge from a blistered surface.

It is given in substance in the dose of from one to two scruples three or four times a day. It is almost impossible to pulverize it without previously drying it in a high degree of heat; and, as the active part is an essential oil, very readily volatilized by heat, the powder is always an improper form for exhibiting it. The best way is to beat it up with honey, or with any kind of syrup, into the consistence of a conserve. A decoction of one ounce of the leaves to one pint of water, boiled down to half a pint, with the addition of two ounces of syrup, may be conveniently given in

* Wedekind über die anwendung der sabinæ by frauenzimerkrankheiten. In Hufeland's Journal, vi. Bd. 1st, nr. 3.

† Uber die anwendung der Sabina by der gicht, &c., 1794.

‡ Alibert. Burdach.

the dose of a large wineglassful every two or three hours. The oil is given in doses of from one to six drops. Hartman gives the following prescription, into which savin enters as a most powerful emmenagogue:

℞.—Pulv. hellebori nig. ℈iv;
Pulv. g. myrrh,
Ferri ammoniat.,
Extract. sabinæ, āā ʒss.

Syrup. croc. q. s. ut, fiant pilulæ ponder. āā gran. unæ. Three to be taken three or four times a day.

The compound tinct. of savin, L. Ph., is given in the dose of a drachm twice a day.

Formulæ.

℞.—Extract. sabinæ ʒi;
Pulv. cantharid. ʒss;
G. aloes socc. ℈i.—M. Divide into sixty pills. Take one three times daily.

℞.—Tinct. sabinæ comp. ℥i;
—— aloes compos. ℥ss.—M. Take a teaspoonful twice daily.

℞.—Fol. sabinæ,
Rad. polygala āā ℥ss;
Aq. bullientis ℥xiv.—Simmer down to ℥xii. Dose, a tablespoonful four times daily.

MENTHA PULEGIUM.—PENNYROYAL.

The plant which goes by the name of pennyroyal, in this country, is the *culina pulegioides*, and not the mentha pulegium, as is commonly thought by those who are not acquainted with botanical distinctions. These two plants, however, are so nearly allied to each other, both in botanical character and in their sensible properties, that we would be led, *à priori*, to expect, which in fact appears to be the case, an entire similarity in their medicinal powers.

As a popular remedy for suppressed menstruation, there is, perhaps, no other article so generally employed. Its emmenagogue virtues are, however, extremely problematical. Cullen considered it as perfectly useless in this respect, although he thinks it of service in "the dyspeptic and spasmodic symptoms of the stomach," which some females experience about the period of menstruation. From my own experience I can say nothing in favor of this article, although I have prescribed it very fre-

* Thesaurus Medicaminum, p. 145.

quently. As a vehicle for the exhibition of other emmenagogue remedies, an infusion of the pennyroyal is much in use in some parts of Europe, and in the interior of our own country.

ROSMARINUS OFFICINALIS.

The rosemary is a plant well known in this country as a common garden shrub. It is indigenous to Spain, Italy, and the south of France. Water draws from it a bitter extractive matter. A very odorous, resinous principle is extracted from it by alcohol. It also yields a very pungent essential oil by distillation. Proust has discovered a sixteenth part of camphor in this oil. M. Margueron has found that oil of rosemary decomposes the nitrate of mercury, the oxymuriate of mercury, the yellow sulphate of mercury, and the caustic muriate of antimony.* It is much in use as a domestic remedy for obstructed catamenia, and it would appear, from the testimony of several respectable writers, that its powers as an emmenagogue are not inconsiderable. Cullen, however, attributes to it no virtues in this way. Dr. Chapman, on the contrary, gives it a better character, and alleges that he has used it in several cases "with unequivocal success." Murray does not mention it as an emmenagogue. I have employed it in but a very few cases, and can therefore say but very little of it from my own experience.

As a warm, aromatic stimulant, it may often be given with much advantage in nervous disorders, such as vertigo, palsy, and spasmodic pains of the stomach. It has also been extolled in the treatment of glandular swellings in infants.† But its usefulness, says M. Alibert,‡ is particularly conspicuous in chlorosis, a disease which is very generally complicated with a weakness of the abdominal viscera, or an aberration of their sensibility. The same author states that a various infusion of this plant is an excellent remedy in chronic diarrhœa.

It is generally used in the form of an aqueous or vinous infusion. The essential oil is given from two to ten drops, on sugar. Rosemary is a principal ingredient of the preparation known under the name of Hungary water.

* Alibert, Matière Méd., vol. ii. p. 127.

† J. C. Speis, Rosmarini Historia Medica. Helm, 1818.

‡ Nouveaux Elémens de Thérapeutique et Matière Médicale, vol. ii. p. 128.

RUBIA TINCTORUM.—MADDER.

This is a perennial plant, and cultivated as an article of commerce in different parts of Europe. The root, which is the only part of the plant employed, is long, slender, of a red color, and succulent, with a white ligneous pith in the centre. Its taste is slightly bitter, and somewhat austere, and imparts both its taste and coloring principle to water.

When given to animals with their food, it soon gives a red tinge to the bones and the urine. Mr. Gibson,* of Manchester, has experimented largely with this article, in relation to its effects upon the bones and secretions of animals, and he has established the fact that its coloring principle is manifested only where it meets with phosphate of lime, which acts as a mordant in fixing and evolving it.

It is chiefly upon the evidence of Dr. Home in favor of its emmenagogue virtues, that its claims to notice are founded. By this eminent physician it was regarded as the safest and most powerful emmenagogue known. He asserts, that out of nineteen cases treated with this remedy, fourteen were cured. By the late Dr. Barton, also, it was thought to possess no inconsiderable powers in this way. Respectable as these testimonies are, it is still very doubtful whether this article possesses any such powers. Very few physicians employ it at the present day; and whatever may be its virtues, it does not possess the confidence of the profession as a remedial article. I have employed it frequently, but never derived the slightest advantage from it. It appears, indeed, to have very little influence of any kind upon the functions of the animal economy; nor has Cullen's suspicion, with regard to its supposed deleterious qualities, ever been confirmed. It is given in substance, in the dose of from one scruple to two drachms.†

POLYGALA SENEGA.

This plant, indigenous to the United States, is entitled to very great attention for its various and important medicinal virtues, whatever we may think of its powers as an emmenagogue.

* Transactions of the Manchester Literary and Philosophical Society.

† Dr. Colhoun informs me that he saw a case of amenorrhœa, in the Pennsylvania Hospital, in which ℥ss was given by mistake, instead of ʒss. It produced a slight discharge of blood from the uterus. The medicine may, therefore, be usually given in too small a dose.

Dr. Hartshorne, of this city, appears to have been the first who noticed the emmenagogue virtues of this article. Dr. Chapman speaks of it in the highest terms of praise. "Of all the emmenagogues which I have tried," says he, "this is the most efficacious, and will be found useful in all forms of amenorrhœa." And again: "I have used it with sufficient success to warrant me in recommending it as one of the most active, certain, and valuable of the emmenagogues." From my own experience, however, as well as from that of some of the most respectable physicians of this city, I am led to a very different estimate of the powers of this remedy as a promoter of the menstrual discharge. I have tried it repeatedly, but hitherto uniformly without success. I am not, however, disposed to regard it as wholly inert in this respect. The testimony in favor of it is too respectable to allow me to doubt its occasionally manifesting such powers. I am nevertheless entirely convinced that Dr. Chapman has expressed an opinion much too favorable of its efficacy as an emmenagogue.

It is best given in the form of decoction. An ounce of the bruised root to a pint of boiling water, and boiled down one-third, will make it sufficiently strong. Three or four ounces of this decoction must be given during the day. It should be commenced six or eight days previous to the regular period of menstruation, and gradually increased to as much as the stomach will bear.*

CANTHARIDES.

Agreeably to the ideas given in the commencement of this chapter, concerning the modus operandi of emmenagogues, we should be led, *à priori*, to expect such virtues in cantharides: for they have undoubtedly a very considerable tendency to determine the circulation to the pelvic viscera.

The emmenagogue properties of cantharides have been noticed by Allen,† Adair,‡ and Burdach.§ The latter writer says: "In obstructions of the catamenia, arising from debility and torpor of the uterine system, fly plasters laid on the lower part of the abdomen or on the sacrum, have been known to do good; or the tincture of cantharides may be given internally, in combination with tincture of aloes." Adair recommends this latter combination as very useful in amenorrhœa. Allen, in enumerating a variety of

* Chapman's Therapeutics and Materia Medica.

† Synopsis Medicinæ, vol. ii. p. 235.

‡ Essays on Fashionable Diseases, &c.

‡ System der Arzneimittellehre, B. iii. s. 107.

emmenagogues, mentions cantharides in union with camphor, but makes no further observations as to the powers of this mixture. Within a few years past Dr. Joseph Klapp, of this city, has directed his attention particularly to the emmenagogue virtues of this article, and has published the result of his experience upon this subject, furnishing thereby much interesting evidence in favor of the existence of such properties in cantharides.*

In my own practice I have found this article to display very decided emmenagogue virtues in several instances. In the majority of cases, however, I have found it to fail in common with other articles of this class.† In exhibiting this remedy, it is necessary to attend to the state of the general system. When the habit of body is full and inflammatory, venesection ought always to be premised to the exhibition of this medicine. In cold and phlegmatic temperaments, its action in this way would seem to be most conspicuous.

It seems to be peculiarly adapted to those cases of amenorrhœa which are attended with fluor albus. In this affection it appears to do good by exciting the mucous membrane of the uterus and vagina to a new train of actions, independently of its power to increase the determination of blood to these parts.

Twenty drops of the tincture are to be given three times a day, and gradually increased until symptoms of strangury supervene.

ALOES EXTRACTUM.

The natural history of this article has already been given under the head of Cathartics. Agreeably to the opinion expressed in the beginning of this chapter, relative to the modus operandi of emmenagogues, there is no difficulty in perceiving how aloes should prove emmenagogue, independent of any specific virtue in this way. When speaking of this article before, its peculiar tendency to act upon and stimulate the rectum was particularly pointed out. The effect of such an irritation, by a well known law of the animal economy—*ubi irritatio ibi fluxus*—is, an afflux of blood to the rectum and neighboring organs. Hence the pernicious consequences of aloetic purges in persons laboring under hemorrhoidal affections. In cases of this kind it is exceedingly apt to bring on bleeding from the tumors in the rectum, or, at least, to render them turgid and inflamed. In

* American Medical Recorder.

† I was directed to the employment of cantharides, as an emmenagogue, by Dr. Klapp's publication, prior to which I was not aware that this article had ever been used for such purposes.

males a long course of aloetic medicines seldom fails to bring on piles. In females, on the contrary, where there is no strong tendency to hemorrhoids, it more commonly brings on copious discharges of blood from the uterus, or, in amenorrhœa, re-establishes the regular flow of the catamenia. In patients of a delicate and relaxed habit of body, with a constipated condition of the bowels, we may often derive very great advantage from a combination of aloes, steel, and myrrh. Where amenorrhœa is connected with hemorrhois, which is not unfrequently the case, aloes is an improper remedy. Instead of re-establishing the menstrual discharge, it is apt to increase still farther the hemorrhoidal affection; and by thus establishing a more copious discharge from the vessels of the rectum, a derivation from the uterine vessels, and with it a diminution of the menstrual effort take place. In chlorotic females, small doses of aloes and iron will sometimes produce very happy effects. I have known it to be prescribed, with prompt success, in a case of amenorrhœa, in combination with pulv. ipecacuanhæ, in the proportion of ten grains of aloes, to one grain of ipecacuanha, every morning, noon, and evening. The semicupium is an excellent auxiliary to this, as, indeed, it is to all the other articles of this class. It does not appear that the emmenagogue effects of aloes is proportionate to its cathartic operation. Small doses, just sufficient to unload the bowels, will, in general, do better than such as are large and more active in their purgative effects.

Formulæ.

℞.—Pil. aloes cum myrrh.,
—— ferri comp., āā ʒi;
Sodæ subcarbonat. ℈i.—M. Divide into thirty pills. Dose, two twice daily.

℞.—G. aloes soccot. ʒss;
Prussiat. ferri ʒi.—M. Divide into sixty pills. S. Take one three times daily.

℞.—Tinct. aloes compos. ʒi;
—— secale cornut. ʒii.—M. Dose, a teaspoonful twice daily. I have used this combination with prompt success in several instances.

POLYGONUM HYDROPIPEROIDES.

Water-Pepper, Biting Knot-weed.—Although this plant has, hitherto, not been included in the list of our vegetable materiæ medicæ, my experience with it, as an emmenagogue, has induced me to regard it as justly entitled to a place among the remedial agents of this class.

This species of polygonum is extremely common throughout every section of the United States. The stem rises to the height of from about twelve to fourteen inches, is slender, smooth, branching, and erect. The leaves are lanceolate, very acute, and end at the base in a short, compressed, sheathing petiole. The stipules are truncate and pubescent. The flowers are in one or two simple slender spikes, and of a pale pink, or white color. It flowers from July to September.

I have employed this plant in, perhaps, twenty cases of amenorrhœa, and I can affirm, that with no other remedy or mode of treatment, have I been so successful as with this. I have seldom found it necessary to continue its use for more than six or seven days, before its emmenagogue powers were manifested. When taken into the stomach, it generally produces a warmth and peculiar tingling sensation throughout the whole system. I have never known it to cause either purging or vomiting; but in nearly all instances, its use was attended with slight aching pains in the hips and loins, and a sense of weight and tension within the pelvis. Several of my medical friends, who, at my request, have employed this remedy in amenorrhœa, found it, in the majority of cases, promptly effectual. I use it in the form of a saturated tincture. A teaspoonful of the tincture should be taken three times daily. It may also be advantageously used in the form of an extract. From four to six grains of the extract may be taken every six hours.

II. *Medicines that increase the Parturient Action of the Uterus.*

ABORTIVA.

SECALE CORNUTUM.—ERGOT.

This article is a parasitic fungus, occupying the glumes of the rye, (*triticum secale,*) of the genus sclerotium, and natural order fungi. For an interesting account of its natural history, the reader is referred to a paper by Dr. William Tully, published in Silliman's Journal of Science and the Arts, vol. ii. p. 48.

There is no article of the materia medica more eminently calculated to excite our admiration of that wonderful and mysterious connection of the various organs of the animal economy, by which

a slight impression upon one part is instantly propagated to another, and there manifested often by the most vehement actions.

Taken internally in a large dose, it excites nausea and vomiting, attended sometimes with vertigo, pain in the head, and increased excitement of the vascular system. Its power, however, of increasing the parturient efforts of the womb, is by far its most prominent and important character. As a *partus accelerator*, it stands alone in the materia medica, and is capable, by its prompt and certain operation, of affording the most happy results, in the hands of a cautious and judicious practitioner.

When labor is protracted in consequence of feeble or irregular contractions of the uterus, this medicine, administered under due precautions, hardly ever fails to excite vigorous and effectual contractions. In a large majority of cases the ergot may, indeed, be regarded as a very fit substitute for the forceps and vectis. When once the uterus is under its influence, the parturient efforts generally continue uninterruptedly; the contractions of the womb never totally cease, but keep up a constant propulsive effort. It commonly manifests its operation in twenty or thirty minutes after its exhibition. Sometimes, however, the effects do not show themselves until a much longer time has elapsed. The contractions are often surprisingly vehement; and it is, therefore, obvious that this medicine cannot be given indiscriminately, or without a proper regard to circumstances. Should it be improperly given, before the os uteri is soft, and in a state to dilate, or has already considerably dilated, rupture of the womb might ensue.

If the mouth of the uterus is considerably dilated, and no particular rigidity of the external parts present, it may be given with perfect safety, and with almost a certainty of success.

By some physicians it is supposed that this article exerts a deleterious influence on the fœtus; the life of which, they assert, it not unfrequently destroys. If this be true, it forms, indeed, a very serious objection to its employment. My own experience with this article has not been sufficient to enable me to speak with confidence upon this point. I suspect, however, from what I have myself seen, and from the detailed experience of others, that there is no good foundation for this opinion, and that the cases which have been recorded by some practitioners, as demonstrative of its injurious effects,* are to be considered in the light of accidental coincidences, rather than the positive results of the medicine.†

* Vide Dr. Chatart's paper in the Med. Repos., for 1820.

† Dr. Hosack, speaking of this article, says: "The ergot has been called, in some of the books, from its effects in hastening labor, the *pulvis ad partum;* as it regards the child, it may, with almost equal truth, be denominated the *pulvis ad mortem*—for I believe its operation, when sufficient to expel the

The cases to which it seems particularly applicable, are :—

1. Where abortion becomes inevitable in the early part of pregnancy, and the contractions are feeble, with considerable hemorrhage. In such cases, the exhibition of this article will not only shorten the sufferings of the patient, but, in a great degree, remove the danger.

2. In cases of alarming hemorrhage near the close of utero-gestation, not occasioned by attachment of the placenta over the os uteri, and not accompanied by efficient contractions.

3. In puerperal convulsions in which a speedy delivery becomes necessary.

4. In lingering labor, the os uteri being sufficiently dilated, and the parts properly relaxed.

5. In retention of the placenta from a want of contraction of the uterus.

6. "In subjects liable to hemorrhage after delivery, from laxity and deficiency of contraction."* In such cases, the hemorrhage may be entirely prevented, by the exhibition of a proper dose of ergot, fifteen or thiry minutes previous to the time when labor would otherwise be expected to terminate.

7. To restrain hemorrhage after delivery.

Ergot has been recommended as an emmenagogue, but I believe upon a very slender foundation. I have prescribed it in four cases, with a view to its emmenagogue effects, but without the least advantage. It seems, indeed, to exert very little influence on the vascular system; and when we consider that as an *uteri contractor*, it must tend rather to diminish than to increase the quantity of blood in the vessels of the womb, its emmenagogue powers will at once appear very doubtful.

This article was used, out of the profession, as a promoter of parturition, more than a century ago. In regular practice, however, it was not known until Dr. Stearns, of Albany, brought its virtues before the public, and to him, therefore, belongs the merit of having first directed the attention of medical men to the extraordinary powers of this article.

In Europe it was at one time regarded as a powerful and extensive cause of disease. Epidemics of a very fatal character were ascribed to the effects of the ergot, mixed with the rye which was ground up for bread stuff. What foundation there is for this

child, in cases where Nature is alone unequal to the task, is to produce so violent a contraction of the womb, and consequent convolution and compression of the uterine vessels, as very much to impede, if not totally to interrupt, the circulation between the mother and child."—*New York Med. and Phys. Journ.*, vol. i. p. 206.

* Dr. E. A. Atlee. Vide American Med. Recorder, vol. iv. p. 141.

opinion I cannot undertake to say. It appears to me unphilosophical, however, to account for epidemics by ascribing them to a cause which must be always, in a degree, present.

SODÆ BORAS.

Borate of Soda.—Borax.—Borax is found in a native state, both in Europe and in South America; but that which is met with in commerce is almost exclusively obtained from certain lakes in Thibet and Persia by spontaneous evaporation. The borax, in an impure state, is found concreted on the margin of these lakes, from which it is dug up in masses, constituting the *tincal* or *crude borax* of commerce. In this state it is imported into this country packed up in boxes or chests, and requires to be refined before it can be applied to medicinal purposes, or in the arts.

Borax, as it is met with in the shops, consists of irregular masses, or in flattened hexahedral prisms terminated by triangular pyramids. It possesses a slightly alkaline and sweetish taste, and manifests alkaline properties when tested with litmus. It is dissolved by twelve times its weight of cold water, and by twice its weight of boiling water. It effloresces on the surface when exposed to the air. "Subjected to a moderate heat, it undergoes the aqueous fusion, swelling considerably, and finally becoming a dry porous mass, with loss of half its weight." When subjected to a high degree of heat it fuses into a limpid fluid, called *glass of borax*. Dr. Duncan states that borax possesses the property of converting the mucilage of gum Arabic, lichen islandicus, or of salep into a gelatinous mass, wholly destitute of adhesive qualities. "It is decomposed by the majority of the acids, by potassa, and by the earthy and ammoniacal sulphates, muriates, phosphates, and fluates." Borax has the property of greatly increasing the solubility of cream of tartar, combining with it, and forming *the soluble cream of tartar*. "This preparation is made by boiling six parts of cream of tartar with two parts of borax in sixteen parts of water for five minutes, allowing the solution to cool, and then filtering to separate some tartrate of lime." It is then to be evaporated to dryness by the heat of a sand-bath. Among the Germans, borax is now frequently employed as an internal remedy. It is said to possess antispasmodic properties, and to exert a peculiar tranquilizing influence on the nervous system, without increasing the action of the heart and arteries. Richter asserts that it tends very considerably to increase the determination of blood to the abdominal and pelvic viscera, and to excite the portal circulation.

In the aphthous sore mouth of infants, borax is much employed

in this country, either in the form of a mouth-wash or of powder. Pitshaft says, that when this affection is attended with acidity in the primæ viæ, which is almost always the case, the most effectual mode of using the borax is to give it internally, in union with magnesia. From two to four grains of the powdered borax, with five or six grains of carbonate of magnesia, should be given two or three times daily, at the same time that a solution of the borax is repeatedly applied to the aphthæ of the mouth, by means of a soft pencil, or lint fastened to the end of a thin piece of whalebone. Borax is undoubtedly the most effectual remedy we possess, as a local application for the cure of aphthæ. In that distressing aphthous affection which sometimes occurs on the internal surface of the pudenda of pregnant females, the application of a strong solution of borax generally procures speedy relief.

Richter says that borax possesses excellent emmenagogue virtues. We have also the testimony of Lentin, Stark (Einricht. des Klinisch. Instituts, &c., Jena, 1782), Bayler, Hufeland (Hufe. Journal, B. ix. p. 127), and Kopp (Beobacht. im. Gebiete der ausub. Keilkunde, 1821, p. 134), in favor of the usefulness of this article in amenorrhœa, or uterine torpor. Kopp declares that he has employed this remedy with peculiar success in deficient or obstructed menstruation, attended with general plethora, or a febrile habit of the system. He gave from four to six grains of the powdered borax four or five times daily. Richter states that he gave this article in a case of chorea attended with amenorrhœa. After its use had been continued for seven or eight days, the menses began to flow and the choreal symptoms to subside. Twelve grains of the borax were administered three times daily. Hirschel says (Hufeland's Journ., vol. lii. p. 27), that he gave fifteen grains, mornings and evenings, and thereby restored the catamenial function, after it had been for more than two years wholly suppressed. Borax has also been used with advantage in deficient or suppressed lochial discharge. (Oswald.)

Of late years, this article has been much used by Wiegand, Rudolph, and others, for increasing the parturient contractions when too feeble from atony or torpor of the womb. Jahn asserts, that he has often known a few full doses of borax, in union with saffron, to excite in a short time, very powerful and effectual labor-pains, and that it very rarely failed to produce an obvious increase of the parturient efforts of the womb. He gave from twenty to thirty grains of the borax with five grains of saffron every hour. Lœffler, also, declares, that during a long course of experience, he has almost uniformly found the borax useful in expediting labor, when arrested or lingering from atony or torpor of the uterus; and Krandendonk (Frorieps Notizen, vol. xix. p.

96) has published statements equally favorable to its virtues in this respect.

Besides its usefulness, as an external remedy, in aphthæ, borax has also been found highly beneficial in inflamed hemorrhoidal tumors, superficial excoriations, sore nipples, and certain cutaneous eruptions. Harless recommends the use of a mixture, composed of one drachm of powdered borax, the yolk and albumen of an egg, one ounce fresh almond oil, and half a drachm of bals. peruv. as an application to excoriated or ulcerated nipples. Hufeland declares, that a solution of half a drachm of borax in an ounce of rose water, is one of the most prompt and certain means we possess for removing those yellowish blotches (Lichen simplex) which often appear on the face, neck and chest of young people. It is also an excellent remedy for chilblains. For this purpose, two drachms of the borax must be dissolved in an ounce of water, and applied to the affected parts several times daily, by means of a small piece of soft sponge. Reinhart (Hufeland's Journ., vol. lxv. p. 121) employed a strong solution of borax in four cases of ptyriasis (dartre furfuracée volante) with entire success. It is said to be an excellent remedy for removing opacities of the cornea. Richter employed it for this purpose with great advantage. Half a drachm of the borax, with double the quantity of white sugar, is to be dissolved in an ounce of rose water. Five or six drops of this solution must be introduced into the eye two or three times daily. (Anfangsgr. d. Wundarzneik., B. iii. p. 127.)

CHAPTER IX.

D. MEDICINES WHOSE ACTION IS PRINCIPALLY DIRECTED TO THE NERVOUS SYSTEM.

I. *Medicines that lessen the Sensibility and Irritability of the Nervous System.*

NARCOTICS.

These are stimulants whose secondary effects are a diminution of the vital powers, producing torpor, insensibility, and sleep.

The more prominent effect of this class of remedies being a torpor of those powers of the animal economy which are dependent on the nervous system, we may infer, with reason, that the action of narcotics falls principally on the sensorium commune and its appendages. This, indeed, seems to be demonstrated by direct experiment with regard to several powerful articles of this class. Brodie* has rendered it extremely probable, by a series of experiments on animals, that the essential oil of almonds, the juice of aconite, the empyreumatic oil of tobacco, and the woorara, produce their deleterious effects by directly destroying the functions of the brain; and that death from the influence of these substances, takes place because respiration, which is entirely dependent on the brain, ceases when the functions of this organ are destroyed.

It has been supposed that there is some one particular substance to which narcotics owe their peculiar effects, and many researches have been instituted to detect this supposed narcotic principle. Upon this subject, however, nothing satisfactory has, as yet, been brought to light. Certain substances, it is true, have been extracted from articles of this class, which possess, in a highly concentrated form, their peculiar virtues. Such are mor-

* Philosophical Magazine for August, 1811.

phium and the prussic acid. As these substances, however, are distinct, and differ in their properties, it is evident that neither can be regarded as the narcotic principle. Besides, the greater number of narcotics contain neither morphium nor prussic acid. These two concentrated substances are, therefore, nothing else than distinct and specific narcotics, which, in their natural state, are found united with other substances.

Narcotics have been regarded by some as producing direct sedative effects upon the system. Cullen placed opium at the head of the sedatives. An attentive observation, however, of the progressive effects of these articles, cannot fail to establish the conviction that this sentiment is at variance with the actual phenomena arising from their action on the living system.

In moderate doses, these substances increase the activity of the cerebral functions. The ideas are more vivid and rapid in their succession. Hilarity, and a general agreeable feeling of mind and body—a more ready and vigorous command of the will over the voluntary muscles of the body—a livelier and more excursive imagination,—a quicker perception of the relation of things—courage, and vigor, all result from the moderate influence of this class of remedies, and indicate the excited state of the system. If, however, they are applied in augmented doses, the brain soon becomes over-excited, and torpor and debility are the result. If the dose be still more increased, sudden diminution of the vital powers, vertigo, delirium, coma, convulsions, and death, ensue.

The class of narcotics furnishes us with some of the most important remedies we possess. They are applicable in almost all varieties of disease in some stage or other of their course. They are particularly indicated in affections of the nervous system, attended with pains or spasms; and in morbid irritability of the brain and its appendages, unaccompanied by an inflammatory condition of the general system. They, also, have a tendency to lessen the mucous secretions; but, in general, they augment those of the serous and urinary organs.

Narcotics, more than any other class of medicines, lose, by repetition, their action on the system. It is therefore necessary, where a continued employment of such articles is required, gradually to augment the dose in order to acquire their due operation.

OPIUM.

Opium deserves to be placed at the head of this class, whether we consider its importance as a remedial article, or its more decided operation as a narcotic. This is the inspissated juice,

obtained from the capsules of the *papaver somniferum*, a plant indigenous to Persia, Arabia, and Egypt, and cultivated with us in gardens. This article, as it is found in the shops, is of a dark reddish brown color externally, and internally of a dusky red. It is opaque, compact, of a peculiar disagreeable narcotic odor, and bitter acrid taste, with some degree of warmth. It is inflammable and partly soluble in water, alcohol, ether, wine, vinegar, and citric acid. The watery solution becomes transparent on filtration and possesses the property of reddening the color of litmus. By adding to this filtered solution pure ammonia, the carbonates of fixed alkalies, the solutions of oxymuriate of mercury, nitrate of silver, subacetate and acetate of lead, the sulphates of copper, zinc, and iron, and the infusion of galls, precipitates are formed.

According to the most authentic chemical researches, opium contains 1, morphia; 2, narcotin; 3, meconic acid; 4, a peculiar acid, not yet fully investigated; 5, extractive matter; 6, mucilage; 7, feculæ; 8, resin; 9, fixed oil; 10, a substance resembling caoutchouc; 11, a vegeto-animal matter; 12, an odorous principle; 13, sulphate of lime and potass; 14, alumina; and 15, iron, besides a considerable portion of vegetable remains. Two other principles have lately been detected in opium, both crystallizable; and very peculiar in their chemical relations. One of these principles, discovered by M. Courbe, is called *meconin;* the other, discovered by Pelletier, has received the name of *narcein.* (Journ. de Pharm., Mars 1832.)

Morphia, as it exists in the opium, is combined with the *meconic* acid, constituting a meconite of morphia. According to the experiments of M. Faure, however, a considerable portion of extractive matter is always intimately associated with these active principles, "and hence the meconite of morphia cannot be obtained separate from the extractive matter."

Morphia is in the form of white shining crystals, without odor, but extremely bitter. When exposed to a moderate degree of heat, it becomes white and opaque, and loses its crystaline form. "At a higher temperature it melts, forming a yellowish liquid, which becomes white and crystaline upon cooling." It is wholly insoluble in cold water, and soluble in about one hundred parts of boiling water. Cold alcohol dissolves it very sparingly; in boiling alcohol it is readily dissolved, but is precipitated again upon cooling. It is but slightly soluble in ether; but is speedily dissolved by the fixed and volatile oils. Litmus paper reddened by acids, has its blue color restored by the solution of morphia, and it converts the yellow of turmeric into brown. Morphia unites readily with acids, forming neutral salts, decom-

posed by the alkalies. "The solutions of potassa and soda are also capable of dissolving morphia, which is precipitated slowly on exposure to the air, in consequence of the absorption of carbonic acid. Aqua ammoniæ has, to a certain extent, the same solvent power; and hence the necessity in precipitating morphia by this alkali, not to employ it in great excess." The nitric acid renders morphia of a fine blood-red color, which, by degrees, changes to yellow. When the morphia and its salts are added to a solution of iodic acid, "or an acidulous iodate, they redden the liquid and set iodine free." Impure morphia is precipitated from its solutions by the infusion of galls; but the pure gallic acid does not disturb them. The narcotic powers of the opium appear to reside exclusively in the morphia.

Narcotin, when perfectly pure, is a white, solid, inodorous and tasteless substance, crystalizable in silky, flexible needles. It is insoluble in cold water; soluble in four hundred parts of boiling water, and in one hundred parts of cold, and twenty-four parts of boiling alcohol. It is also dissolved by the fixed and volatile oils. The acids combine with it, and form with it crystalizable compounds, some of which are very bitter, and all of them are soluble in water. Narcotin is precipitated from its solution in diluted nitric acid by the alkalies. "It may be distinguished from morphia by its insipidity and its solubility in ether, by assuming a yellow instead of a red color, under the action of strong nitric acid, and by not producing, either in the pure or the saline state, with the salts of iron, the blue color which characterizes morphia and its salts." The best menstrua for extracting the narcotin from opium are the diluted acids, though water also extracts it by long maceration. By whatever process it may be extracted from the opium, it is always obtained mixed with morphia, and may be separated from the latter by treating it with sulphuric ether, which dissolves it without affecting the morphia, and yields it by evaporation.

The effects of narcotin on the animal system have been variously represented. It was at first supposed to constitute the active principle of opium. Magendie declares, that experimenting with narcotin on animals, he found one grain, dissolved in oil, sufficient to produce complete stupor in a dog, which terminated in death in the course of twenty-four hours. This stupor differed very obviously from the tranquil sleep produced by morphia and its preparations in other dogs; and Magendie concludes that the latter principle—namely, morphia—causes the medicinal anodyne and soporific effects of opium, while the narcotin produces the unpleasant and often distressing effects on the stomach and nervous system, which frequently result from a dose of opium. It appears from the experiments of Derosne and Magendie, that the

unpleasant effects of narcotin on the system are very materially diminished, or wholly prevented, by giving it in union with acetic acid. Magendie states, that he introduced twenty-four grains of narcotin, dissolved in vinegar, into the stomach of a dog without destroying the animal's life; and M. Bailly gave it to the extent of sixty grains, dissolved in muriatic acid at a dose, without noticing any effect from it whatever. Orfila, also, knew a man to take thirty grains of it dissolved in acetic acid, without the slightest obvious effect. He states, moreover, that though wholly inactive when dissolved in nitric or muriatic acid, yet, when given to dogs, in solution in acetic or sulphuric acid, or in olive oil, thirty or forty grains of it will suffice to produce fatal effects. He found, also, that the solution in acetic or sulphuric acid, given to animals, invariably gave rise to strong excitement; while a sedative effect constantly resulted from the solution in olive oil.

From all that has been ascertained on this subject, therefore, it is manifest that narcotin, whether given by itself or dissolved in an acid, exerts no very powerful influence on the animal system; and "the narcotic effects which have been attributed to it, have probably arisen from the employment of a preparation not entirely freed from other principles contained in the opium." (U. States Dispensatory.)

Meconic acid.—This constituent principle of opium, when obtained in a pure state, consists of a white, solid, crystalizable substance, of an acid taste, followed by considerable bitterness. It melts at a temperature of 220° F., and is volatilized without undergoing any change in its properties. Both water and alcohol dissolve it readily. It possesses the property of reddening vegetable blues, and of producing a blood-red color with the salts of iron. The meconic acid is not employed in a separate state for medicinal properties. The unpleasant effects which, in certain habits, arise from the use of opium, have been ascribed to this substance; but there does not appear to be sufficient foundation for this opinion.

The effects of opium are evinced, in a greater or less degree, upon whatever part of the system its application is made. Injected into the cellular membrane, it is said to act with great energy, and when introduced into the cavity of the peritoneum, it speedily produces convulsions and death. According to Orfila, "the effects of opium are, in general, more decided when it is injected in glysters, than when it has been introduced into the stomach." By this we are not to understand that the same quantity produces as much or more effect when injected into the rectum, than when taken into the stomach, but simply that the medicine, when applied to the former part, in a suitable dose, acts in a more prompt and decisive way, in consequence, perhaps, of its not being

subjected to the action of the digestive powers in this situation—a circumstance which must very generally take place when it is brought into the stomach. According to Nysten and Orfila, opium acts more energetically when injected into the cellular texture of the body.*

The same writers state, also, that opium does not destroy the contractility of the muscles to which it is applied; and that a heart will continue to contract for a considerable time, when plunged into a solution of opium. This, however, is contradicted by Wilson Philip,† who states that, although he found opium, when applied to the external surface of the heart and alimentary canal, to produce no sensible effect on their muscular power, yet, when brought in contact with their internal surface, it produced "the same effect as when directly applied to the muscular fibres themselves, immediately, unless the quantity be extremely small, impairing their power, and destroying it instantly, if the quantity be considerable.

Opium is said to produce no particular effects when applied immediately to the brain or nerves, and yet it is supposed, by the same physiologists who make this assertion, that the poisoning effects of this article depend on its absorption into the circulation, and its direct action upon the brain. This contradiction, for such it appears to be, can only be reconciled by supposing that the action of this narcotic is less powerful when applied directly to the medullary substance of this organ, than when it acts, through the medium of the blood, on the internal surface of its capillary vessels.

The question, whether opium is to be regarded as a sedative or an excitant, has been much agitated, and it is still considered by some *sub judice*—as an unsettled point.‡ The prevalent opinion, however, at present, is, that opium is unequivocally a stimulant. To me, indeed, nothing seems to be more demonstrable than this point. Orfila quotes Tralles as being the first who held opium to be a stimulant.§ To the celebrated John Brown, however, must be ascribed the merit of having fully demonstrated the excitant properties of this article.

The effects of opium vary greatly according to the quantity given. In small doses it sensibly excites the nervous and vascular systems. The cerebral functions in particular, are rendered more active and energetic. Volition is stronger and more prompt,

* Orfila's System of Toxicology, p. 250.

† Inquiry into the Laws of the Vital Functions, 2d edition.

‡ Pharmacologie Générale, par M. Barbier, M. D., 1816.—In this work opium is considered as essentially sedative in its effects.

§ Usus Opii Salubris et Noxius in Morborum Medela Auctore. Balthas. Lou. Tralles, 4to. 1754.

and a temporary vigor is felt in all the voluntary exertions of the body. Vivacity and joyfulness—courage and ambition—indifference, or rather defiance to the ills of life; and, in short, all those delightful feelings which spring from a conscious energy of mental and bodily power, and an absence from painful or unpleasant sensations, arise from a well-regulated dose of this medicine.

If the dose be augmented, its narcotic effects become more conspicuous. A species of drunkenness ensues; the blood becomes congested in the vessels of the brain; the mind is unsettled and incoherent; voluntary emotion is performed with less freedom; the sensibility is diminished; the eyes are suffused, and vision is indistinct. Finally, the voluntary motions are suspended; the sensorium commune ceases to exercise its control over the animal functions of the system, and profound and heavy sleep weighs down every conscious faculty. If the dose has been very large, the sleep becomes more and more lethargic; the sensorial power is rapidly impaired, in consequence of which, respiration is imperfectly performed, the blood ceases to receive its due proportion of oxygen in the lungs, which tends still further to diminish the cerebral functions, until finally they stop altogether, and with them all the other movements of the animal system.

Such are the immediate effects of an excessive dose of opium. There are other consequences, however, which follow its long-continued or habitual use, demonstrating with equal force the deleterious influence of this article upon the living economy, when improperly taken.

The habitual opium-taker, unless he is under the immediate influence of this potent narcotic, evinces all the symptoms of physical and intellectual imbecility. He is timid, low-spirited, and pale; he experiences a tormenting anxiety of feeling; is totally disinclined, as well as unfit, for mental and bodily exertion; he is peevish, and feels pains in different parts of the body; his extremities are cold; indigestion torments him; he cannot sleep, and feels a tremor throughout all his body. When the system is entirely free from the influence of the accustomed stimulant, torments of the most distressing kinds are experienced.

The following, therefore, may be enumerated as the ordinary effects of this narcoctic on the animal system:

1. Its primary effect in a small or regular dose is an increase of the force and frequency of the pulse. When given in a very large dose its excitant operation is extremely transient, and the pulse almost immediately becomes fuller and slower.

2. It diminishes muscular irritability, and lessens the peristaltic motions of the intestinal canal. It not unfrequently, likewise, occasions a difficulty and pain in making water.

3. It lessens some of the secretions, whilst it augments others. Thus, it diminishes the secretion of the gastric and pancreatic juices, and the mucus of the bowels, occasioning thereby a dryness of the mouth, fauces, and the intestinal canal, attended by thirst, inappetency, indigestion, and emaciation. It lessens, also, the mucous secretion of the bronchia and nose. The secretion of bile,* too, according to the opinion of some, is diminished by the action of opium. The serous secretions, on the contrary, especially that of the skin, are considerably augmented by the use of this article. In many persons it produces a singular pruritus, and in some, a papular eruption on the surface of the body. It increases, also, the aqueous exhalation from the lungs;† and one of its most constant effects, when frequently or habitually taken, is to augment the secretion of urea by the kidneys.

4. It at first excites, but afterwards lessens the sensorial powers; inducing torpor, insensibility, and sleep. Hence its applicability in all cases where there are pain and nervous irritability, unaccompanied with an inflammatory condition of the system.

Opium is generally employed in substance, or in the form of tincture. Where we wish to produce a sudden impression, the tincture should be given; as in this form it will be immediately diffused through the stomach, and more speedily applied to an extensive surface of its inner coat, than when given in the shape of a pill, which requires a considerable time for its solution and its entire application to the part upon which it is to act.

Upon some individuals the effects of opium, even in very small doses, are extremely distressing: so much so, indeed, that they cannot be induced to take it, however urgent the symptoms may be which demand its employment. It sometimes produces much nausea and vomiting, attended with a peculiar distressing sensation in the head. In other instances, it gives rise to harassing restlessness, nervous tremors, and a feeling of anxiety and sinking in the præcordium. In some individuals it occasions a general febrile irritation, with pain, and a sense of fullness in the head, and sometimes more or less delirium; in others it gives rise to great faintness or partial syncope, with a general feeling of great uneasiness and distress. In many instances, these disagreeable effects may be obviated or greatly diminished, by exhibiting the opium with some of the vegetable acids, as vinegar, lime juice, &c.; or by giving it in union with an alkali, particularly

* "The feces of persons," says Dr. Paris, "after the use of opium, are not unfrequently clay-colored, from the suspension of the biliary secretion." Burdach, on the contrary, asserts that opium increases the secretory action of the liver.

† Burdach, Arzneimittellehre, B. iii. s. 491.

the carbonate of potash. One grain of opium rubbed up with ten grains of carb. potass., and dissolved in about an ounce of water, may, in general, be taken by such persons without the least inconvenience. The black drop,* as it is called, is also an excellent preparation, and may be taken by persons who cannot endure the opium in its solid form. Dr. Porter, of Bristol, England, states that a solution of opium in the citric acid possesses several very important advantages.† It is said that this preparation is a very powerful anodyne, "operating with less disturbance than the more ordinary forms of this substance."

Dr. Paris observes, that "a watery infusion, made by infusing powdered opium in boiling water, will often operate without producing that distressing nausea and headache which so frequently follow the use of this substance."

When opium cannot be retained on the stomach, it may be applied by frictions to the external surface, in combination with olive oil or camphorated liniment.

Dr. Chapman, however, asserts that the practice of applying opium as an embrocation, "is altogether delusive, and deserves no attention. Let it be managed as it may, opium applied to the surface, in any form, produces no constitutional impression. Yet," continues he, "as a mere local remedy to assuage pain, I have no doubt of the efficacy of such applications." To me there appears much inconsistency in all this. If opium "assuages pain as a local remedy," it must act upon the sentient extremities of the part to which it is applied. I can, however, see no reason why

* The following is the formula for making this useful preparation:—

"Take half a pound of opium, sliced, three pints of good verjuice, (juice of the wild crab,) and one and a half ounce of nutmegs, and half an ounce of saffron. Boil them to a proper thickness, then add a quarter of a pound of sugar, and two spoonfuls of yeast. Set the whole in a warm place near the fire for six or eight weeks, then place it in the open air until it becomes a syrup; lastly, decant, filter, and bottle it up, adding a little sugar to each bottle." One drop of this preparation is equal to about three drops of the tincture of opium, of the London Pharmacopœia. "This preparation," says Dr. Paris, "which has been long known and esteemed as being more powerful in its operation, and less distressing in its effects, than any tincture of opium, has, until lately, been involved in much obscurity; the papers, however, of the late Edward Walton, of Sunderland, one of the near relations of the original proprietor, having fallen into the hands of Dr. Armstrong, that gentleman has obliged the profession by publishing the manner in which it is prepared."

† The following is the formula for its preparation: Liquor morphi citratis. ℞. Opii crudi opt. ℥iv; acidi citrici (cryst.) ℥ii; semel in mortario lapide contunda, dein aquæ distillatæ bullientis Oj. affunde; et intime misceantur; macera per horas viginti quatuor; per chartam bibulosam cola.

it should be capable of "producing constitutional impressions," when acting on the sentient extremities of the stomach, and not do the same thing when it acts on the nerves of the surface. I am indeed, entirely convinced, both from my own experience and the testimony of others, that the opinion, so confidently advanced by Dr. Chapman, upon this point, is wholly without foundation. When applied to a surface divested of its cuticle, *morphia*, or its salts, never fails to produce very considerable anodyne and soporific effects on the system. This is, indeed, a most excellent mode of employing opium, when from idiosyncrasy, or other circumstances, it cannot be conveniently administered internally. I have in many instances, obtained prompt and highly satisfactory soporose and anodyne effects, from the application of the sulphate of morphia in this way. If the cuticle be removed from any part of the surface, by means of a small epispastic (about an inch in diameter), and one or two grains of morphia sprinkled on the denuded part, the narcotic effects will be as prompt and decided as if a full dose of opium had been taken into the stomach; and so far as I have observed, always without any of the disagreeable consequences which frequently arise from its internal administration. Opium will also act promptly when introduced into the rectum, either in a solid form or dissolved and injected as an enema.*

Incompatible substances: oxymuriate of mercury, acetate of lead, alkalies, infusion of galls and of yellow cinchona, infusion of coffee.

I shall now proceed to an account of the practical application of this article in the cure of diseases, which will tend still more fully to develop the nature of its important properties.

As, along with its excitant virtues, it possesses the power, by its secondary effects, to lessen the sensibility and irritability of the system, it is applicable in all those febrile diseases where any of the vital organs are in a state of irritation, or morbid irritability, and unattended by high inflammatory vascular action.

In the advanced stage of typhus fevers, when there are much restlessness, vigilance, and a small, frequent, and weak pulse, attended with delirium, subsultus tendinum, and other symptoms of nervous irritation, opium is one of our best remedies. In such circumstances, Cullen says, it may be employed freely and generally in large doses, repeated every eighth hour, unless sleep and a remission of the delirium should allow of longer intervals.

Dr. R. Grattan, in a late report of the Dublin Fever Hospital, speaks in very high terms of the employment of opium in the delirium of typhus. "Where delirium prevails," says he, "to a

* Paris's Pharmacologia, p. 469.

considerable extent, and no sleep has been procured after the head has been shaved, the temporal artery opened once or twice, the nape blistered, and purgatives administered, and more particularly should it be near the close of the disease, an anodyne, with from twenty-five to thirty drops of the tincture of opium, and as many of the vinum ipecacuanhæ, repeated every third or fourth hour until sleep is procured, will be found to produce a marked change for the better."*

In typhus, attended with local inflammation within the chest or abdomen, opium, combined with camphor, and a very minute portion of tart. antim., often affords very considerable advantages. During the epidemic typhoid pneumonia, which raged in almost every section of the United States during the cold seasons of the years 1812–13–14, I had frequent opportunities of witnessing the good effects of this combination. Where the pain in the chest was very severe and the pulse small, weak, and frequent, I generally derived much advantage from the exhibition of a quarter of a grain of opium with five grains of camphor and one-sixteenth of a grain of tart. antim. every two hours.

It should be observed, however, that when the delirium, &c., depends on arachnoid or cerebral inflammation, which is frequently the case in the latter stage of typhus, opium can hardly fail of doing much injury. It is only when the cerebral disturbance depends on mere irritation of the brain, without actual inflammation, that this narcotic can be employed with propriety. When, therefore, the delirium is attended with great pain in the head, an injected state of the eyes, a flush on the cheeks, and intermitting muttering raving, the propriety of administering opium will be extremely doubtful, and if resorted to at all, should be administered with great caution.

Opium has been recommended in every stage of intermittent fevers. Dr. Trotter† gave it in the cold stage, and he speaks very favorably of this practice. A full dose of this article, taken a half or whole hour before the accession of the paroxysm, exhilarates the spirits, the surface becomes relaxed, the countenance flushed, and assumes a calm and cheerful appearance, and the pulse, from being weak, oppressed, frequent, and irregular, becomes full, equal, and more natural. Stork says, that this practice has been sometimes attended with injurious consequences. I have, however, frequently employed opium in this way, and generally with evident advantage, and never with any injurious effects. By Lind, Cullen, Hegewisch, and others, this medicine

* Transact. of the Association of Fellows and Licentiates of the King and Queen's College of Physicians, Ireland, vol. iii. p. 440.

† Medicina Nautica.

is recommended in the hot, instead of the cold stage. When given in this stage, it produces, according to the observation of Lind, the following salutary effects. 1. A curtailment and diminution of the violence of the paroxysm. 2. Relief to the disturbance and pain of the head, abatement of the burning heat of the surface, and a copious perspiration. 3. Refreshing sleep, from which the patient awakes bathed in sweat, and nearly free from all complaint. The sweat which follows the exhibition of opium, brings on an agreeable softness of the skin, and lessens very much the burning sensation which attends the sweating stage. It is said also by Lind, that the employment of opium in this way, renders the operation of the bark more efficacious. From a very considerable experience in this disease, I am led to regard the use of opium, in its hot stage, as a very useful, and by no means hazardous practice. It certainly very generally expedites the succession of the sweating stage, and thereby shortens the paroxysm.

In gastritis and enteritis, whether idiopathic or secondary, opium is often of great service. "When given in health," says Dr. Armstrong, "it 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 these complaints in conjunction with proper depletion, it may be fairly accounted one of the best remedies."† In that species of enteritis which sometimes accompanies puerperal fever, the same eminent writer asserts, that he has employed opium as a principal remedy where the lancet and active purges could not be used.‡ In these cases the dose should be large; from sixty to one hundred and twenty drops are to be given, according to the urgency of the symptoms, and repeated, if the pain does not abate by the first dose. The two remarkable effects of this remedy, in gastritis and enteritis, are, an abatement of the pain and a reduction of the pulse. "The patient often falls asleep shortly after the exhibition, and the pulse, which had been previously small and quick, becomes full and slow."§

It is not so difficult to account for the aperient effects of opium in such cases as might at first sight appear. As the contractility and sensibility of the bowels are much augmented in consequence of their inflamed condition, it is quite probable that the constipa-

* In a note to Cullen's Materia Medica, Dr. Barton, speaking of the effects of this article in dysentery, says, "It is a fact, that sometimes no medicine more effectually procures stercoraceous stools than opium."

† Armstrong on Puerperal Fever, p. 171.

‡ Ibid., 172.

§ Ibid., 174.

tion depends, in a great measure, on the preternatural contraction of their muscular fibres, occasioned by their augmented susceptibility to the irritation of their contents. Opium, therefore, by lessening the irritability and sensibility of these parts, prevents the common irritants from throwing them into preternatural contraction, and thereby does away a principal cause of the constipation. By determining to the cutaneous exhalants, too, a property which opium possesses in an eminent degree, there is a direct derivation made from the internal inflamed, to the external surface, affording a most powerful auxiliary for the reduction of the local affection.

Much has been said in favor of the employment of opium in the treatment of acute hepatitis. Dr. Robert Hamilton, many years ago, published observations illustrative of the good effects of this narcotic in union with calomel in this affection. Dr. Johnson, too, says, "that in conjunction with antimonial powder, opium forms a most admirable auxiliary to mercury in acute hepatitis;" and Dr. Armstrong has published statements equally in favor of this practice. My own experience enables me to testify my confidence in the usefulness of this combination in the treatment of this disease. It is proper to observe, however, that the general and local inflammatory action should be moderated by bloodletting and mercurial purgatives, before the use of the opium is resorted to; and that it should always be administered in conjunction with calomel. After the violence of the disease has been subdued by prompt and efficient depletory measures, from three to five grains of calomel with a grain of opium, may be given every four hours, and continued until the gums are affected.

In the treatment of acute peritonitis, also, opium may be employed with great advantage. After the violence of the local and general inflammatory action has been moderated by bloodletting, purgatives, and fomentations of the abdomen, the administration of opium in union with calomel, is sometimes attended with highly beneficial effects. "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 the 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. Whenever opium is administered in any abdominal inflammation, the *dose should be large;* for a small dose often stimulates, whereas a large one is a direct sedative."

In the earlier stages of inflammatory rheumatism, opium is an improper remedy on account of its stimulating properties.

When, however, employed in combination with other articles which give it a more decidedly diaphoretic operation, it may often be used with good effect very early in the disease; but as a general rule, it will be best to abstain from this remedy, even in its combinations, until the inflammatory character of the disease has been somewhat reduced by antiphlogistic measures. When this has been done, opium is a valuable remedy. I am decidedly of opinion, that if opium be given at all in inflammatory diseases, it should be exhibited in very large doses. Large doses appear to be less stimulating than small ones. The sensibility and irritability of the system are greatly reduced by a large dose of this narcotic, and with them all those morbid conditions of the system which depend, on, or are influenced by, a preternaturally excited state of the vital properties. Experience, at least, has convinced me that we may sometimes procure permanent relief from a very large dose of this medicine, in the present disease, after small ones have been found to aggravate its symptoms. After proper depletion, I have often given as much as four and five grains for a dose, and with results more favorable than my experience would lead me to expect from smaller doses. When there is intense pain in any part of the body, opium may be given in very large doses without producing its ordinary narcotic effects on the system. "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."*

Opium, however, is chiefly useful in those cases of subacute rheumatism where the pains are wandering, and the pulse is hard, small and frequent.† In cases of this kind it should be given with a view to its diaphoretic effects; and to insure these, it must be combined with antimonials, or given in the form of pulv. ipecac. compos.

To mitigate the distressing pains in gout, opium is the most important remedy we possess. Its advantages, however, as is observed by Scudamore, depend on the mode of its employment, both as to preparation, dose, and the particular circumstances of the case. If the inflammatory diathesis be considerable, and the bowels constipated, antiphlogistic and aperient remedies must be employed before opium is resorted to. With respect, however, to the first of these objections to the free employment of opium,

* Treatise on the Gout and Rheumatism, p. 124.

† Ettmüller de vi Opii Diaphoretica, p. 48.

Dr. Scudamore makes the following very judicious observations: "Sir E. Home, in an interesting paper 'on the influence of the nerves upon the action of the arteries,' has related several experiments which unite very well in the support of my present conclusion, that, in inflammation dependent on local and general irritation of the nerves, our rules of treatment must often be varied from that which we observe in the primary excessive action of the vessels in common inflammation, from which the nerves become affected in a secondary degree. On many occasions, in the gouty paroxysm, 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 bed-side 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."

In chronic catarrhal affections, or in recent cases unattended by any considerable phlogistic diathesis, opium is a remedy of very great value. It is particularly useful in those long standing catarrhal affections of old people, where there is too abundant a secretion of bronchial mucus. In cases of this kind, small doses of opium check the inordinate secretion of the mucus, and allay irritation, not only by their direct narcotic influence upon the mucous membrane, but also by diminishing the secretion of the irritating matter in the bronchia.

In catarrhal affections, opium is best given in the form of camphorated tincture. Where the expectoration is sparing, as it often is in recent cases, opium, in its uncombined form, is of doubtful efficacy; for, although it may allay irritation, it has a tendency still further to diminish the mucous secretion of the bronchia, and thus to prevent the inflamed vessels from relieving themselves by an augmented discharge. In cases of this kind, therefore, we must give it in such combinations as will enable us to obtain its soothing effects without diminishing the expectoration. For this purpose it will be necessary to combine the opiate with some expectorant remedy. The syrup of squills, mixed with paregoric elixir, is, perhaps, as useful a combination of such remedies as we possess.

In pneumonia, opium can seldom be a proper remedy. In the beginning of pulmonic inflammation, the stimulus of the opium would be injurious, by its direct tendency to increase the inflammation, and in the latter stage, by diminishing the bronchial secretion, whereby nature is relieving the engorged vessels of the inflamed organ. To this, however, there are exceptions; and we occasionally meet with circumstances in the more advanced stage

of peripneumony, which indicate the propriety of a recourse to this remedy. Where the disease has been so far subdued as to put off its more inflammatory appearances, and a troublesome cough keeps up some degree of pain, inquietude, and want of sleep, opium, combined with squill, gum, ammoniacum, or some other active expectorant, is an indispensable remedy.

With regard to the employment of opium in pulmonic diseases attended with catarrhal symptoms, it may be laid down as a general rule of practice, that where the cough is not accompanied by an expectoration sufficiently copious, the opiate should be given with some expectorant. Where, on the contrary, the cough is attended by an expectoration too profuse, but not critical, opium uncombined, or in the form of its simple or compound tincture, is the best mode of exhibiting it. It is also to be observed, that in all cases where a copious secretion of bronchial mucus occurs as a critical discharge, as in the resolution of pulmonic inflammation, opium is a hazardous remedy, except it be given in very small doses, and combined with some active expectorant.*

In the advanced stages of phthisis, opium is the best, and in fact, almost the only palliative we possess. It lessens the frequency and violence of the cough—checks the colliquative alvine discharges, and in its ultimate but not least benign influence, assuages the pangs of parting life. Its euthanasial virtues in this, as well as in many other diseases that lead with unerring steps to the grave, are, indeed, amongst its most admirable qualities, and would alone be sufficient to entitle it to the greatest attention.

In the treatment of small-pox, opium is often of essential service. Where the suppuration does not go on regularly, and there exists a great deal of restlessness, opiates, cautiously administered, generally are very useful. They must not, however, be given when the excitement runs high, and where they are indicated, it is proper to administer them with gentle laxatives to obviate their constipating effects. In the maturating stage of the confluent form of this disease, opium, when used with these precautions, allays restlessness and pain, without improperly interfering with the regular progress of this disease.

In scarlatina, I can say little of the employment of opium, from my own experience. But there can be no doubt that circumstances may arise in this, as in almost every other disease, which will indicate the propriety of this remedy. Where the eruption does not appear freely, or remains back entirely, and the pulse is quick, tense, and small, accompanied by a pale skin, and an anxious, oppressed breathing, opium may be given, in some diaphoretic combination, with advantage.

* B. J. Tralles de Opii suspecta ope in Pleuritide Curanda, 1774.

In the treatment of dysentery, opium is a most valuable remedy. Sydenham regarded its employment as indispensable in this disease. "Ita," says he, "necessarium est opium in hominis periti manu, ut sine illo manca sit, ac claudicet medicina."* Cullen, however, influenced by his speculative notions concerning the nature of this disease, regarded opium as a "precarious remedy," and "to be avoided as much as possible." As, according to his sentiments, dysentery is always essentially connected with constriction of the bowels, he apprehended that the employment of opium in its treatment would tend still further to increase the constriction, and to lock up the irritating matters in the intestinal tube. That these fears are by no means well founded, seems to be conclusively established by the concurrent testimony of a great majority of our best writers. I have already said, upon the authority of Drs. Armstrong and Barton, that although opium tends to constipate when taken in health, yet when the bowels are inflamed or highly irritated, as they are in dysentery, its tendency to this effect is much less than might be supposed: and when administered with proper laxatives, it often aids considerably in bringing off stercoraceous stools. Be this as it may, I think it quite certain, that whenever opium is injurious in dysentery, it arises from its tendency to increase the inflammatory excitement of the system, and not from its supposed constringent influence on the bowels. In commending the powers of opium in dysentery, it must, however, be well understood, that it is not to be employed without a particular attention to the state of the general circulation. In the commencement of the disease, when the febrile symptoms run high, opiates would be obviously improper. It is not, therefore, until the general excitement has been somewhat reduced by anti-inflammatory measures, and the bowels evacuated by laxatives, that opium can be employed with propriety in this disease. I do not, however, think it necessary that we should in general delay administering opiates until the system is much exhausted, or the general excitement greatly reduced. Given in large doses, and in combination with a suitable laxative, as ol. ricini, it will often afford the happiest effects, at an early period of the disease, provided the inflammatory symptoms have been previously mitigated by depletory measures. In the latter stage of this disease, opium is, for the most part, absolutely indispensable. The dysenteric discharges are sometimes kept up by a relaxed state of the bowels, attended with an irritated pulse and a dry and harsh skin. Here it would be in vain to look for a more suitable remedy than opium. In chronic dysentery it is very advantageously combined with calomel, a combination, indeed, upon which our principal

* De Dysenteria, anno 1660.

reliance is, in general, to be placed in its treatment. From the intimate connection which exists between the external surface of the body and the mucous membrane of the intestinal tube, it is evident, that on the principle of derivation, much advantage may be gained by exciting the vessels of the skin. It is, therefore, proper in most cases, to combine the opiate with some other article, which, without interfering with its anodyne properties, will increase its tendency to act upon the cutaneous exhalants.

A solution of opium in some mucilaginous fluid, injected in the form of an enema, is highly serviceable in relieving the urgent and painful, but ineffectual efforts of the tenesmus in this complaint.

As opium lessens both the secretions of the bowels and the irritated motions of their muscular fibres, its action is directly adapted to the suppression of colliquative alvine discharges. In diarrhœa, accordingly, it generally acts very beneficially. Given in combination with very minute portions of calomel, it constitutes one of the most important remedies we possess in the treatment of such cases. I have repeatedly put a permanent stop to chronic discharges from the bowels, by exhibiting a quarter of a grain of opium with one-eighth of a grain of calomel every four hours, after various other modes of treatment had been tried ineffectually.

In cholera, opium may afford important advantages by proper management. After the contents of the stomach and bowels have been well washed out by copious draughts of diluents, opium ought to be given in large doses, to allay the irritation of these parts. It is to be particularly recollected, that little advantage will be gained from this remedy, unless it be exhibited in very large doses. From two to four grains according to the urgency of the symptoms, should be administered every two hours until relief be obtained.

The employment of opium, in union with calomel, in the Asiatic cholera, has received the sanction of nearly all who have treated this formidable malady. My own experience has convinced me that moderate doses of opium, administered at regular and short intervals in combination with calomel, is one of the most useful remedies we possess in the management of this disease. It cannot be doubted, however, that opium has often been employed to an injurious extent in this malady. When given in very large doses, the general sensibility and irritability of the system will be still further blunted, and the vital actions consequently reduced; or the blood will be so powerfully determined to the head, when the vital powers begin to react, as to occasion fatal oppression of the brain. Half a grain of opium, with from ten to twenty grains of calomel, may be safely administered every

hour; and I am inclined to believe that all the advantages which can be derived from these two remedies may be obtained from doses of this size.

In the cholera of infants this article is of doubtful efficacy. It can never, I apprehend, be employed in this disease, unless it be in its chronic form, without considerable risk. In the acute form of cholera infantum, there is a very strong tendency to cephalic affection. Many of those who die of this disease, exhibit, before death, all the characteristic symptoms of hydrocephalus. Be our speculative notions what they may with regard to the pathology of this disease, it is certain, I think, that the cerebral affection so frequently observed in its ultimate stage, depends on an irritation communicated to the brain from the primary abdominal disorder. Whatever, therefore, has a tendency to increase the determination to the head, cannot fail to augment the danger in this disease. Opium possesses this power in an especial manner; and I am warranted by experience to declare, that its tendency in this way renders it, for the most part, an unsafe remedy in this disease.

Of the virtues of opium in dropsy I can say nothing from my own experience. It has, however, been recommended by some writers as being of considerable efficacy in cases attended with a relaxed and debilitated habit of body.* Mr. John Mason, surgeon at Leicester, in a letter to Dr. John Fothergill, relates two cases of dropsy successfully treated by moderate doses of opium. The first patient, a female in the fortieth year of her age, after having twice submitted to the operation of paracentesis, was effectually cured by taking once or twice a day, a teaspoonful of a tincture of opium, made by infusing ʒss of this article in a pint of gin. The second patient, also a female, aged forty-two, took opium from about two-thirds of a grain to a grain and a half every night on going to bed, and was entirely cured by it.† In dysury, from a paralytic state of the bladder, or a spasmodic contraction of the passages, opium is said to be highly useful when injected into the bladder in the form of a weak aqueous solution.

Opium occasionally produces very beneficial effects in diabetes. Dr. Ferriar gave it combination with bark and uva ursi, in the proportions of a scruple of each of the latter to half a grain of the opium; and his success appears to have been very considerable, having cured ten cases out of thirteen. He directed the use of lime-water and an animal diet whilst using this remedy. Dr. Prout considers opium the most efficacious remedy we possess in diabetes. Dr. Elliotson, also, reports three cases, treated principally with opium, in which its beneficial effects were conspicuously

* Burdach, Arzneimittellehre, B. iii. s. 503.

† Medical Observations and Inquiries, vol. vi. p. 19.

evinced. He gradually carried the dose to the extent of ℈j bis die.* "On looking over the tabular view presented by Dr. Elliotson," says Dr. Prout,† "we find that the first immediate effect of opium upon the urine is, to increase its specific gravity. This is what might have been expected from this remedy, and evidently depends upon the diminished secretion of water, while that of sugar remains unaltered, by which the urine is, of course, rendered more concentrated, and consequently heavier. As the remedy is persevered in, the urine acquires its original specific gravity, and even becomes lighter. The quantity of sugar is diminished, and that of urea much increased, even sometimes so as to become greater than natural. Lithic acid makes its appearance often in abundance, a substance which has been denied to exist in diabetic urine; and the urine acquires altogether a more natural color and appearance, and is rendered much less prone to undergo the vinous fermentation."

Opium is a principal remedy for obtaining temporary relief from those distressing pains of the stomach which frequently attend indigestion. In such cases it ought to be given in small doses. "Large doses of this medicine," says a late writer, "have no place in the treatment of indigestion, except for the purpose of relieving severe pain. They tend to increase the other symptoms. Very small doses, however, two or three minims of tincture of opium, for example, repeated two or three times a day, often prove highly serviceable in allaying morbid irritation, and their constipating effect is generally easily counteracted. They sometimes, indeed, have very little of this effect."‡ According to this writer, the pulvis ipecacuanha compositus is the best form for exhibiting small doses of opium in this disease. "From two to four grains," he observes, "of this preparation, given every six or eight hours, appear to have a peculiar effect in allaying the irritations attending indigestion. It appears to be the best adapted to those cases in which that combination of languor and restlessness, often so remarkable in this disease, prevails." All this accords entirely with my own experience; I have been much in the habit of exhibiting small doses of this medicine in the gastric pains attendant on indigestion; and as a means of temporary relief I know of no other remedy so uniformly effectual. In exhibiting opium, however, in this disease, it is of the utmost consequence to the welfare of the patient, to guard against his forming a habit of taking this substance. It should, therefore, never be long and

* Numerous cases illustrative of the efficacy of hydrocyanic or prussic acid in affections of the stomach, &c., p. 89.

† On Calculous Diseases, p. 76.

‡ A Treatise on Indigestion, by A. P. W. Philip, M. D., p. 181.

regularly given; but only occasionally resorted to when the symptoms which indicate its employment are urgent. This precaution, though highly important in all circumstances under which the frequent employment of opium seems to be necessary, ought to be especially impressed upon those who are obliged to resort to its use in indigestion. For the dyspeptic is not only a sufferer in body, but also in mind. He is often overwhelmed by a despondency which is even more insufferable than his bodily pains. If, in such a state, he once experiences the tranquilizing effects of opium, he will resort to it again, and again, for relief from his sufferings, until, from habit, he can no longer do without it.

With regard to the exhibition of opium in hemorrhages, it may be observed, in a general way, that in all cases where venesection is indicated, it cannot be employed with safety. In hemoptysis, however, attended with a spasmodic or irritable state of the system, cold extremities, anxiety, restlessness, paleness of the face, alternating with sudden flushes, pale urine, small and contracted pulse, and a troublesome cough, opium is not only a safe, but an indispensable remedy. Richter,* who greatly extols the power of opium in such cases, says that it should be given in combination with camphor or ipecacuanha, and administered in large and frequent doses. From my own experience I can say nothing of its curative powers in hemorrhage. There can, however, be little doubt of its entire adaptation to cases attended with the particular circumstances just enumerated.

In colica pictonum, opium is a very valuable remedy. Administered in very large doses, and in combination with proper laxatives, it affords more immediate relief than any other remedy with which I am acquainted. Riverius, Sydenham, Huxham, Stoll, and De Haen, speak highly of its powers in this disease. Baglivius thought that the disease was more apt to terminate in paralysis, when opium was given. De Haen, on the contrary, states that, from much experience, he found nothing better calculated to prevent paralysis, than opium administered with large doses of oil. "Sed," says he, "experientia edoctus affirmo ad præcavendam paralysin, opio, cum copioso olio, nihil præstantius dari, potentiusque, propter dolorem sopimentum."† He asserts, what indeed has been amply confirmed by the experience of others, that it renders the operation of cathartics more certain by its antispasmodic and soothing effects. "Eo enim contractos, irritatosque nimium nervos, utcunque relaxante, et pacante, purgatio aptius officio fungitur suo."

I have had considerable experience in this disease, and my

* Specielle Therapie, von G. A. Richter, M. D., B. iii. s. 297.

† Ratio Medendi, tom. i. p. 184.

reliance has been uniformly placed on the exhibition of large doses of calomel and opium in combination, repeated two or three times a day, until the gums were affected by the mercury. In general I have observed that no *permanent* relief is obtained until the calomel affects the general system. The opium, however, is indispensable to mitigate the immediate sufferings of the patient; and when given in a very large dose—from six to eight grains—it not unfrequently enables the calomel to open the bowels, especially when assisted by a dose of castor oil. Dr. Luckey, formerly of Elizabethtown, in this state, has published the result of a very large experience with this article, in the present disease. Foiled by the ordinary modes of practice, he resorted to the use of powerful doses of opium, followed by castor oil, and always with the happiest effects. "I began," says he, "by administering large doses of opium, and generally gave ten grains at a dose, every hour, until ℈ii were taken. I was exceedingly rejoiced to find that the symptoms now began to yield, and a few common doses of oleum ricini, or the infusion of senna, would produce the desired effect. Of forty cases which occurred in my practice, none, except one, proved fatal after the adoption of this practice."* It may be proper to observe, that these cases occurred in a neighborhood within the circle of my own practice, while I resided in Lancaster county; and I can therefore bear testimony to the accuracy of the above statement. The prevalence of this disease arose from the country people in the vicinity of Elizabethtown, putting up their *apple-butter* during the fall of 1814, in earthen vessels badly glazed, got from a neighboring pottery. The acid of the apple-butter, acting upon, and dissolving the glazure of the crocks (composed of red-lead), converted it into acetate of lead, which being received into the system with the apple-butter, gave rise to this disease. I saw a very considerable number of these cases, and although I depended chiefly on affecting the system with mercury, and therefore gave opium in much smaller doses than those mentioned in the above quotation, yet I believe that upon the whole the Doctor's practice was more promptly successful than my own.

A great deal has of late years been said of the powers of opium in the treatment of mania-à-potu. That it will frequently procure important advantages in this disease, I am fully persuaded from no very limited experience. As an auxiliary to the emetic treatment of this disease, lately introduced by Dr. Klapp, it is frequently found highly useful. After the operation of one or two emetics, it will, in general, operate very favorably in procuring sleep, an effect which it ought to be our particular object to pro-

* American Medical Recorder, vol. i. p. 503.

duce as speedily as possible. If opium be given at all in this disease, it should be administered in large doses, and, unless particular circumstances forbid its further use, repeated until sleep be procured. As I have, however, already spoken pretty fully of the pathology and treatment of this singular variety of mania, under the head of emetics, I shall not pursue the subject any further in this place.

In tetanus, opium has been a good deal employed. From my own experience I can say nothing in its favor. I have, indeed, seen it used in one case, where it seemed to me to have acted perniciously. The patient, who had received very large doses, fell into a profound lethargic stupor, and died, as if by apoplexy. It must be confessed, however, that very respectable authorities may be adduced in favor of the employment of opium in this disease. Dr. Richard Huck speaks in very high terms of large doses of opium, in combination with musk, in tetanic affections.* Dr. Stutz, also, has published some interesting facts and observations concerning the employmemt of opium in spasmodic diseases.† He exhibited a combination of alkali and opium in traumatic tetanus, and, as he declares, with the most extraordinary effect. A similar combination was used with great success by M. Bouchet, surgeon of the Hôtel Dieu, at Lyons, in tetanus from wounds. He gave one drachm of opium with three of potass. carbon. in twelve hours. Dr. Morrison, in a recent publication on this disease, states that he has met with more than a dozen cases where the cure could be fairly ascribed to opium. It should, he observes, be given in very large doses, and frequent. The celebrated Dr. Odier, of Geneva, speaking of the treatment of tetanus, observes: "Les anti-spasmodiques les plus actifs et les plus poignans, tels que la musc, l'æther, l'alkali volatil, etc., n'ont aucune prise sur la maladie. Les seuls que n'aient paru avoir quelque succès, sont l'opium et le mercure, mais seulement en très grandes doses."‡ Dr. Delaroche has reported a case of tetanus in a girl of about fourteen years of age, which was cured by large doses of opium and mercury.§ What part, however, ought to be ascribed to the opium or the mercury, is impossible to tell. Certain it is, that mercury has cured cases of this disease without opium, and we are, therefore, warranted in ascribing no inconsiderable share to its influence, in these cases.

Odier observes, that the best means for ascertaining whether

* Medical Observations and Inquiries, vol. iii. p. 331.

† Salzburgische, Medicinisch-Chirurgische Zeitung.

‡ Manuel de Médecine Pratique, p. 189.

§ Journal de Médecine de M. Roux. The same case is mentioned by Odier, in Bib. Britann. Sc. et Arts, vol. xxxvii. pp. 107 and 111.

the disease be tetanus, in a doubtful case, is to exhibit opium in gradually augmented doses. If the disease be tetanus, it will require an exceedingly powerful dose before its peculiar effects are manifested. But in cases which merely simulate tetanus, as occurs sometimes in hysteria, this narcotic evinces its powers much more readily and energetically.

Opium has also been used in chorea; and by some its powers as a remedy in this disease have been a good deal extolled. After venesection and the operation of purgatives, Sydenham prescribed it as an anodyne in the evening. But it does not appear that he placed any particular dependence on its curative powers in this disease. He prescribed it for its temporary soothing and antispasmodic effects, and depended for a cure chiefly on bleeding and purgatives. Given with this intention, it will, no doubt, be found useful in this, as well as in most other similar affections. When, however, the disease depends on an irritation in the alimentary canal, arising from the presence of irritating saburral matters, which, we have reason to believe, is frequently the case, opium can only be useful after the bowels have been well evacuated by suitable purgatives.

Very little can be said in favor of the powers of opium in epilepsy. De Haen mentions a case of extreme violence, which was greatly mitigated by the exhibition of opium immediately before the accession of the paroxysm.* It is not unlikely, that where the disease is independent of any organic cause, and connected with great irritability of the system, opium may do good, if it can be so managed as to be given a short time before the paroxysm. Dr. Fothergill says, that in epilepsies that come on from the sudden influence of terror, or those which proceed from violent pain, as is sometimes the case in dysmenorrhœa, opium may be resorted to with much advantage.† It ought never, however, to be employed where there are marks of strong congestion in the vessels of the head; and Richter states expressly that it is wholly inapplicable to congenital cases, or such as depend on a hereditary predisposition.‡

In hysteria, the good effects of opium, as a palliative, are much less equivocal. During the paroxysm it may often be advantageously exhibited in combination with musk, valerian, ether, the volatile alkali, castor, assafetida, &c. It is especially indicated where the patient suffers violent pains, as is frequently the case

* Epilepsia desperata et horrenda, tentatis frustra quam plurimis, tandem siluit postquam opium ante paroxysmum nervos reddidisset insensiles. Ratio. Med., vol. ii. p. 52.

† Medical Observ. and Inquir., vol. vi. p. 80.

‡ Specielle Therapie, vol. vii. p. 682.

when the disease manifests itself chiefly in the abdominal viscera, or where the convulsions are violent and obstinate.* I recently saw a case attended with exceedingly violent convulsions. Bleeding, emetics, assafetida and ether were given in large doses, but all in vain. During the intermission of the convulsions she suffered excruciating pains in the abdomen. After the disease had continued for about six hours unmitigated, it was promptly arrested by an enema containing ten grains of opium. Opium is said to be more efficacious in spasmodic affections when given in union with sal tartari than when used by itself.†

Whytt recommended opium in hydrophobia. I know of no fact, however, which goes to establish its character as a remedy in this fatal and terrible disease. It appears, indeed, by the experiments of Magendie, that the most powerful narcotics have no perceptible operation either on man or on animals laboring under this disease, whether the substance be received into the stomach or injected into veins. Magendie injected a solution of ten grains of opium into the veins of hydrophobic dogs, without producing any sensible narcotic effect; while a single grain induced eight or ten hours' deep sleep in a healthy animal. The same effect was noticed in a hydrophobic man by MM. Dupuytren and Magendie. They injected about eight grains of the gummy extract of opium into the radial vein of a young man affected with this disease, without any apparent result.‡

Opium has been a good deal extolled for its curative virtues in venereal cases, by Michaelis, Saunders, Henry, Cullen, and others. Clement Tode, also, brings forward a number of facts obtained from the celebrated surgeon Sibernius, which appear to prove the sanative powers of opium in this disease.§

In chronic syphilis, attended with rheumatic pains of the bones and ulcers, opium has often been found useful. According to the statement of Schœpf,‖ it would appear to be particularly beneficial in cases of chancre having a disposition to spread from the glands to the cellular tissue, and assuming a foul and spongy appearance, attended with much pain, and an acrid ichorous discharge. Having, however, never used it myself in this disease, except to allay irritation and pain, and in union with mercury, I can say nothing from my own experience concerning its virtues

* Odier, Manuel de Médecine-pratique, p. 202.

† Bibliothek der Pract. Heilkunde, von C. Hufeland and E. Osann.—June, 1822, p. 331.

‡ Journal de Physiologie Experimentale, vol. i. No. 1, Jan. 1821.

§ Alibert, Mater. Med. &c., vol. ii. p. 86.

‖ T. D. Schœpf von der würkung des Mohnsafts in der lust seuche. Erlangen, 1781.

as an anti-venereal remedy. Dr. Pearson* does not regard it as possessed of any specific powers against this disease; he nevertheless considers it as an article of no inconsiderable value in the treatment of certain cases of this affection. It diminishes that excessive irritability of the system which sometimes occurs, and which is inimical to the regular operation of mercurial remedies, as well as the sanative effects of the system. In gonorrhœa, where there is much chordee, opium, in combination with nitre and camphor, is a very useful remedy. In hernia humoralis, also, opium is often indispensable. It not only diminishes the pain, but it seems also to have considerable power in effecting the reduction of the tumefaction and inflammation.

In that species of mortification which occurs in old people, "beginning at the extremity of one or more of the small toes, and passing on, in more or less time, to the foot, ankle, and sometimes to a part of the leg, most commonly destroying the patient," opium is a remedy of very great value. Pott, who first introduced the employment of this substance in the present disease, declares, "that he is perfectly convinced, that by its means, and by its means solely, he had saved lives which, without it, must have been lost." He gave it in the dose of about two grains night and morning. Since the time of this celebrated surgeon, many practitioners have been able to verify the hopes which his account of the effects of this remedy is calculated to inspire. In a case of this kind which came under my care some years ago, I had the most satisfactory proof of its powers. I gave it, however, in much larger doses than those recommended by Mr. Pott. My patient took from six to eight grains in twenty-four hours, given in divided doses at intervals of four hours.

Opium may also be usefully employed in the suppurative stage of inflammation. It sustains the powers of the system, and enables the part to secrete a more perfect pus.

As an antispasmodic and anodyne it is often of essential service in allaying the pain and relaxing the spasm in nephritis calculosa. With a similar intention it is generally resorted to with great advantage during the passage of gall-stones. In such cases the dose should always be large; otherwise the symptoms will be rather aggravated than mitigated by its use.

The *sulphate of morphia* is a neat and powerful preparation of opium. It is readily dissolved in water, and affords a convenient mode of exhibiting this narcotic, where strong prejudices exist against laudanum and opium. It is now very frequently employed instead of the ordinary forms of opiate remedies, and

* Observations on the Effects of various articles of Materia Medica in the Venereal Disease, by J. Pearson, F.R.S. London, 1805.

will in general remain very easily on the stomach. The ordinary dose is one-fourth of a grain, which is equivalent to about one grain of opium.

The *acetate of morphia*, also, is a very convenient and active preparation of opium, and is by some employed in preference to the sulphate. It is readily dissolved by water, and more sparingly by alcohol. One-fourth of a grain of this preparation is considered equivalent to a grain of good opium.

Formulæ.

ANODYNE LINIMENT.

℞.—Ol. amygdalar. ʒss;
Vitelle ovorum No. iii;
Pulv. opii ʒss.—M.

℞.—P. opii ʒss;
— camphoræ ʒi;
Pices alb. ʒss;
Petrolei q. s.—Ad. consistent. liniment. tenuior.

℞.—Pulv. rad. ipecac.,
—— camph., āā gr. ii;
—— opii,
Submuriat. hydr., āā gr. i.—M. To be taken at once, on going to bed, in nervous irritation, with functional disorders of the liver and stomach.

℞.—Pulv. nitrat. potass. ʒiss;
—— opii gr. vi.—M. Divide into six equal parts. An excellent opiate, where there is much nervous irritability, with a tendency to febrile irritation.

℞.—Muriat. hydr. gr. ¼;
Aq. rosar. ʒi;
Mucilag. sem. cydon. ʒii;
Tinct. opii ℈ii.—M. A very useful lotion, in subacute ophthalmia.

LACTUCARIUM.

This name has been given to the inspissated juice of lactuca saliva, or common garden lettuce, by the late Dr. Duncan, of Edinburgh. It possesses, in an inferior degree, the soporific and anodyne properties of opium, and may therefore be employed in all cases where this substance is applicable.

The ancients were not unacquainted with the sleep-producing powers of lettuce. Its virtues as such are commemorated by poets and philosophers. "Allusions to this plant," says Dr. Paris, "frequently occur in the medical writings of antiquity; we are told that Galen, in the decline of life, suffered much from morbid

vigilance, until he had recourse to eating a lettuce every evening, which cured him. Among the fables of antiquity, we read that, after the death of Adonis, Venus threw herself on a bed of lettuces to lull her grief and repress her desires."

All the species of lettuce contain more or less of this narcotic. According to the experiments of Dr. R. Coxe, of this city, the lactuca sylvestris contains it in greater abundance than any of the other species of this genus of plants.*

It was at one time supposed that the use of this substance tended to weaken the powers of the genital organs; and that its long-continued employment enfeebled the sight.† These suspicions are, however, totally unfounded.

Dr. Duncan, in a small work on phthisis pulmonalis, published about six years ago, speaks very favorably of the medicinal virtues of this article. It affords, he says, the anodyne effects of the opium, without producing the disagreeable consequences which not unfrequently follow the employment of opium. Like this latter article, it allays pain and irritation, and produces sleep. I have prescribed the lactucarium in cases that indicated the employment of an anodyne, but it has not appeared to me to possess powers which ought to give it a preference, perhaps, under any circumstances, to the use of opium. Where opium in substance or its tinctures, cannot be taken on account of idiosnycrasy, it may, in general, if not always, be so combined as to do away its disagreeable effects. Dr. Chapman states, that the dose of this article is the same as that of opium. This is a mistake. It must be given in at least double the dose which we employ of opium, to produce the same effect. Mr. Deyeux has shown that water distilled from this plant possesses very energetic properties, "and which we employed with much advantage as the base of anodyne potions." He mentions also the case of a lady who was subject to violent nervous spasms, who found no remedy so effectual as lettuce water. This plant, made into a cataplasm, forms an excellent anodyne application.

CAMPHORA.

Camphor is a peculiar vegetable principle, existing always in the state of a concrete. When purified it is white, fragile, somewhat unctuous to the touch, and tenacious when broken between the teeth. Its odor is fragrant, and exceedingly penetrating; its taste bitter, pungent, and aromatic, producing a strong glow of

* Transact. of Amer. Philos. Soc., 1797.

† Alibert, Elém. de Thérap., vol. ii. p. 98.

heat in the tongue and palate. It is very volatile, especially in warm weather. When thrown on red.hot iron it burns with a brilliant flame, emitting copious fumes, which condense in the form of soot. It is soluble in alcohol, but water takes up only about a nine-hundredth part of its weight. Its most perfect menstrua, however, are the concentrated vegetable acids. The mineral acids also dissolve it; and so do the fixed and volatile oils. The nitric acid converts camphor into an acid, distinguished by peculiar properties. When pulverized camphor is added to the solutions of gold, silver, and mercury, these metals become revived. Buillon Lagrange considers this substance as a volatile oil, rendered concrete by the presence of carbon.*

The camphor of commerce is chiefly obtained from the *laurus camphora*, a tree growing in great abundance in Borneo, Ceylon, Java, Japan, &c. That which is brought from Sumatra is the product of the *dryobobans camphora*. Almost all the labiate plants, such as lavender, sage, rosemary and thyme, contain camphor, and it may be obtained from the roots of sassafras, galangal, zedora, ginger, cinnamon, cassia, &c. An artificial camphor may be formed by passing the muriatic acid gas through oil of turpentine; "this factitious product, however, is to be distinguished from native camphor in not being soluble in weak nitric acid, and also in not being precipitated by water from its solution in strong nitric acid."†

It is still a disputed point whether camphor should be considered as a diffusible or narcotic stimulus. For my part I am well satisfied that its proper place is among the narcotics. Its action, like that of the most unequivocal narcotic substances, is especially directed upon the sensitive or nervous system. The heart and arteries are but slightly influenced by its operation.

Taken in a moderate dose it exhilarates, and produces a gentle diaphoresis, without materially increasing the force and frequency of the pulse. In very large doses it excites vomiting, tremors, anxiety, syncope, vertigo, insensibility, epilepsy, coma, or morbid wakefulness, and produces very obvious diminution of the pulse. Dr. Alexander, of Edinburgh, states that, after having taken one scruple of camphor, his pulse became somewhat slower, without experiencing any other sensible effect from the medicine. He afterwards swallowed two scruples, which had the effect of immediately sinking his pulse from seventy-seven to seventy, but which returned to its former frequency at the end of about thirty minutes. A giddiness then came on, which gradually increased until he became entirely insensible. After a short period he was

* Alibert, Mat. Med., tom. ii. p. 105.

† Paris's Pharmacologia.

seized with strong efforts to vomit, succeeded by convulsions and transient mania.* I have lately taken several scruple doses of camphor for the purpose of observing its effects on the circulation, and found that the pulse, though slightly increased in fullness, was not in the least increased in frequency. I experienced some giddiness and a sensation of fullness in the vessels of the head. Alibert observes: "The greater part of the phenomena that have hitherto been noticed as the effects of camphor, either in animals or in the human system, appear to correspond with those which result from the action of opium. Like opium, its action is promptly directed to the brain and the whole nervous system. This remedy seems to possess the power of at once producing a torpor of this organ, and of increasing the irritability of the muscular fibre. This difference, however, has been remarked between the action of opium and camphor; opium begins by irritating, and afterwards induces torpor and insensibility: camphor, on the contrary, first produces a languor in the system, and to this languor succeeds a violent excitement in all the organs of the animal economy."†

Camphor admits of a great variety of remedial applications. In the treatment of typhus fevers it has been particularly recommended by the French and German physicians, and it is, indeed, a medicine of very considerable utility in diseases of this kind. In the latter stage of typhus, when the pulse is small, the skin dry and hot, and delirium, wakefulness, subsultus, and other symptoms of nervous irritation exist, camphor will often produce great benefit. Hildebrand speaks in the most favorable terms of the employment of camphor in the advanced stage of this disease, (*On Contagious Typhus*, p. 209,) and Richter declares, that his experience with this remedy, in a great many instances, has led him to regard it as one of the most valuable remedial means we possess in the latter period of this malady. (*Specielle Arzneimittellehre*, vol. iii. p. 368.) Its power of allaying the delirium and other nervous symptoms of typhus, is, I think, more decisive than that of any other remedy we possess. I have seldom omitted to prescribe it when these symptoms were present, and I have often had occasion to be pleased with its effects. Burdach says, that in typhus accompanied with inflammation of the lungs, liver, or bowels, camphor in union with tartar emetic, nitre, or calomel, may be employed with great advantage. In the pneumonia typhoides, I have known it to be employed with small doses of opium and rad. serpentaria, with decided benefit.

In the treatment of puerperal fever camphor has been recom-

* Philosophical Transactions, vol. lvii. part 1.

† Alibert, Mat. Med., tom. ii. p. 106.

mended as a remedy of great usefulness. In this disease, however, its powers are but little to be depended on. In the early stage camphor would be hurtful, and in the latter inadequate. It cannot be too much impressed on the minds of practitioners, that copious and prompt depletion, conjoined with cathartics, and used within the first twelve, or at furthest twenty-four hours, are the only means we possess upon which any reliance ought to be placed, for arresting the fatal progress of this disease. After its inflammatory symptoms have been subdued and much prostration exists, camphor may be used with advantage. In such cases it is best given in union with opium.

In bilious fevers, camphor may often be used with very good effects. Callisen has published an account of an epidemic bilious fever, in which this remedy, given in very large doses, was attended with remarkable success. He says that it was administered in doses of half a drachm every three or four hours, and almost always with the effect of rendering the respiration more easy, the pulse better, and the skin moist and comfortable.* In the latter periods of the more violent forms of this disease, such doses may, perhaps, be necessary; but in the milder cases of our bilious remittents, it would undoubtedly be hazardous to employ the remedy to this extent. After the alimentary canal has been well evacuated of its contents, if the skin remain hot and dry, with a full and frequent, but compressible pulse, small doses of camphor, in union with nitre and tartarized antimony, are an exceedingly useful remedy.†

Barthez states, that he employed camphor in union with nitre, with excellent effects, in intermittent fevers accompanied with nervous symptoms. In the exanthematous fevers, where, from deficiency of excitement, the eruption appears imperfectly, or where it has been repelled, camphor is a useful remedy. It is said to be particularly beneficial in cases of this kind when the urinary passages are affected, and the urine is pale and watery, accompanied with a sensation of distension and pain in the lumbar region.

Richter says, that camphor is an excellent remedy in cynanche-parotidea—and that it is especially useful for preventing metastasis, or for obviating its evil consequences. This article has also been found very beneficial in the advanced stage of scarlatina maligna, or putrid sore throat.

This remedy may also be given in rheumatic affections with

* Alibert, Mat. Med., tom. ii. p. 108. Callisen, dans le premier volume des Mémoires de la Société Royale de Copenhague.

† Pulv. nitri. ʒi; pulv. camphoræ gr. xvi; tart. antimon. gr. i. M. in chartulas viii. divid. One of these to be taken every two or three hours.

much advantage. It is especially useful in this disease when the skin is dry and hard, and may be very efficaciously exhibited in union with spiritus mindereri, opium or antimonials. In chronic rheumatism I have given it in conjunction with sulphur, tartarized antimony, and gum guaiac, with decided benefit. Tourtuel speaks highly of a solution of one part of camphor in eight parts of sulphuric ether, together with two parts of cajeput oil, as an external remedy in rheumatic affections.*

In the treatment of chronic catarrh, camphor, in union with minute portions of opium, and the nitrate of potass, often affords very material relief. In catarrhal affections Kotrum (Hufeland's Jour., B. iii. p. 48) strongly recommends the use of camphor in conjunction with muriate of ammonia and tart. emetic. I have used this combination in acute bronchitis, after proper depletion, with decided benefit. Two grains of camphor with ten grains of the muriat. ammon. and about one-eighth of a grain of tart. antim. may be given every two hours.

When, after free depletion, and other direct antiphlogistic measures in pleurisy, a troublesome cough remains, with oppressed respiration and pain in the chest, great benefit may in general be derived from the use of a mixture of camphor, ipecacuanha, and opium. Richter declares, that in this state of the disease he has often derived unequivocal advantage from this combination.

In the treatment of spasmodic and convulsive affections, camphor has been much recommended by the German and French physicians. In epilepsy it is stated to have been given with complete success. Cullen says he found it useful in this disease. "I have not, indeed," says he, "known an epilepsy entirely cured by camphor alone: but I have had several instances of a paroxysm, which was expected in the course of a night, prevented by a dose of camphor exhibited at bed-time; and even this when the camphor was alone; but it has been especially useful when given with a dose of cuprum ammoniacum, of white vitriol, or of the flowers of zinc."† Richter observes, that camphor is of no service in the ordinary cases of epilepsy, continued from habit; but where it depends on a suppressed cutaneous eruption, or on onanism, or where it is connected with unusual venereal desires, he considers it a remedy of great utility.‡ It is also much recommended in those cases of epilepsy which come on about the age of puberty, and which are attended by considerable disturbance of the mind.§

* Burdach.

† Cullen's Mat. Med., vol. ii. p. 213.

‡ Richter's Specielle Therapie, vol. vii. p. 681.

§ Locher's Observat. Practic., p. 42.

In mania, camphor was formerly very often prescribed; and many cases are on record of its having been successfully given.* The late Professor Barton, in a note to Cullen's Materia Medica, says: "I have certainly employed camphor with advantage in some cases of mania. In one case which occurred under my care in the Pennsylvanja Hospital, it effected a complete cure." Dr. Gooch thinks camphor with hyoscyamus, the best soporific with which we are acquainted in mania and melancholia. He gives ten grains of each at bed-time, after the use of the tepid bath.†

Camphor has also been used with success in the cure of chorea. Pitt employed it with benefit in union with valerian and the cold bath;‡ and Wilson reports a case in which he gave it in conjunction with assafetida, with perfect success. He carried the dose to the extent of eighteen grains of the camphor four times a day.§ Richter states, that when the disease appears as the effect of cold, and is attended with a dry and harsh skin, great debility, and a pale relaxed appearance, and especially where there is an irritatio seminalis, camphor is peculiarly advantageous.‖

In eclampsia, or puerperal convulsions, camphor has been recommended by some writers. Where the disease occurs in hysterical females, and the countenance remains pale, with a corded and irritated pulse, important advantages may, no doubt, be gained from this remedy. In patients, however, of a full habit of body, and where the convulsions are attended with a powerful determination to the vessels of the head, it ought not to be resorted to. In cases of this kind our chief dependence must be placed on the free use of the lancet. Richter says, where there is much congestion in the vessels of the brain, very copious and repeated bleeding, both topical and general, is indispensable.¶ Dr. Dewees, too, places his principal reliance on venesection. The reader is referred to his essay on this subject, published in the second volume of the American Medical Recorder, for a full and satisfactory exposition of the utility of blood-letting in this disease.

Richter says that camphor is one of our most valuable remedies for counteracting or removing the evil effects which sometimes result from the repercussion of chronic cutaneous eruptions. In certain varieties of dropsy, also, this article has been found very useful. In dropsies succeeding scarlatina when the pulse is free from tension, camphor, administered in union with the nitrate

* Philosophical Transactions, vol. xxxv.

† Transact. Lond. College of Physicians, vol. vi. for 1820.

‡ Abhandlungen. f. Pract. Aerzte, b. v. st. ii, p. 218.

§ Medical Commentaries of Edinburgh, vol. ii. p. 463.

‖ Specielle Therapie, vol. vii. p. 764.

¶ Ibid., p. 543.

of potash, will often do much good. In general, whenever the production of the disease is connected with suppressed perspiration from the influence of cold, camphor, in conjunction with nitre, or ipecacuanha, is calculated to afford considerable advantage. In cases of this kind, Bracht (Hufeland's Journ., v. xlviii. p. 33) administered the camphor in union with calomel, and the golden sulphur of antimony, with marked success. Richter, also, employed camphor in union with calomel, in cases of anasarca after scarlatina, with the happiest effect. (Speciel. Arzneimittellehre, B. iii. p. 383.)

In amaurosis, connnected with a leuco-phlegmatic habit of body, camphor, given in doses gradually increased from a few grains to one scruple, three or four times a day, has been employed with complete success.* Arnemann (Magazin., B. i. p. 98) states, that he has, in several cases of this kind, restored the sight by the internal employment of camphor. He gave two grains of it, in conjunction with twenty grains of valerian, twice daily, and gradually increased the dose of camphor, until it gave rise to considerable vertigo. Flemming, also (Hufe. Journ., v. xxxii. p. 107) cured a case of amaurosis, in a person of a phlegmatic temperament and enfeebled habit of body, by the use of camphor in conjunction with the extract of arnica. The dose of each was, at first, two grains, both of which were gradually increased to one drachm.

This article has been much recommended for the purpose of relieving strangury from cantharides and other causes. I have myself derived unequivocal advantages from its use in such cases. There are many, however, who deny its powers in this respect. It appears to possess a tendency to lessen the excitement of the genital organs. Of this fact I have had very decided evidence. Several years ago I was consulted by an elderly married man, of rigid moral habits. He informed me that he suffered very much from painful erections, and an incessant propensity to venery. He was naturally of a gloomy disposition, which was much increased by his complaint. I ordered him camphor, in two-grain doses, to be taken three times a day. In a week he returned and told me he was almost entirely relieved; and by a further continuance with the remedy he was completely rid of his tormenting complaint.

Müller (Hufeland's Journ., B. xiv. p. 99), relates the case of a clergyman, who, for a long time, was extremely tormented with incessant priapism, and almost irresistible venereal desires. Camphor was prescribed in full doses, which, in the course of some weeks, had the effect of entirely subduing the disease. Richter, also, has given an account of a similar case of great violence and

* Burdach's Mat. Med., vol. ii. p. 397.

obstinacy, which was ultimately cured by the employment of camphor.

In consequence of its powers, in this respect, camphor has been strongly recommended for the cure of nymphomania, and a considerable number of instances have been reported of its successful use in this distressing malady. Alibert states that he placed very little confidence in its powers in this respect, until he observed its effects in a female who was suffering under symptoms of furor uterinus, with occasional manifestations of mental derangement. The students of the Hospital St. Louis gave her one drachm of camphor. She experienced no inconvenience from it. But her excessive venereal desires were entirely allayed. These, however, returned, but were always removed by the camphor. At last the medicine brought on a great disposition to syncope, vertigo, and excessive pain in the head, which obliged the patient to lay aside its use.*

Camphor is also an excellent palliative remedy in painful menstruation. I have frequently given it in cases of this kind, and generally with much advantage.

Dr. Bodtcher, a Danish physician, has lately published some interesting observations on the employment of the vapor of camphor as a remedy in various diseases. He found it particularly useful in the complaints affecting the cavities of the nose, the throat, and the chest. In cases of complete stoppage of the nose, commonly called snuffles, a piece of camphor kept before it is said to afford complete relief in a few minutes. Dr. Bodtcher also found it very useful in cynanche, when held before the nose or the open mouth. The vapor of camphor has likewise been employed in spasmodic coughs, with great benefit.†

Dr. Maury asserts, that camphorated liniment is a most excellent remedy for the cure of itch. He employs the liniment of Vareby, composed of two ounces of oil of almonds, triturated with two drachms of camphor. This is to be rubbed in on the forearms, and inner surface of the thighs, twice daily. It is seldom necessary to continue its use for more than fourteen days to effect a complete cure. (*Reports Hospital of St. Louis.*)

Camphor may be given either in the form of powder, emulsion, or solution. By adding a few drops of alcohol to it, it may be readily pulverized. Its solubility is much increased by triturating it with carbonate of magnesia, and hence it is best given in this way when employed in substance. The mixture is, however, much the most agreeable form for exhibiting this remedy. The dose of camphor is from two grains to one scruple.

* Alibert, Mat. Med., vol. ii. p. 109.

† American Medical Recorder, vol. v. p. 568.

Formulæ.

℞.—Pulv. camphoræ gr. xxiv;
Submuriat. hydrarg. gr. xxxvi;
Sulphat. morphiæ gr. ii;
Conserv. rosæ q. s.—M. Divide into twelve pills. One to be taken every hour or two hours in cholera, or violent and painful diarrhœa.

℞.—Pulv. camphoræ ʒss;
Pulv. nitrat. potassæ ʒi.—M. Divide into six equal parts. One to be taken every hour as a palliative in dysmenorrhœa, or for allaying after-pains.

℞.—Pulv. camphoræ ʒi;
Pulv. g. Arab. ʒii;
Sacch. albi ℥ss;
Aq. fontanæ ʒviii;
Spir. nit. dulc. ʒiii.—M. Dose, a tablespoonful every three or four hours in typhoid fevers, attended with delirium.

℞.—G. camphor. ℈iii; solve in
Æther sulph. ʒi; adde
Tinct. opii ʒii.—M. Dose, from thirty to forty drops, to allayexcessive vomiting, when unattended with fever; and as an antispasmodic in hysteria.

HUMULUS LUPULUS.—THE HOP.

I HAVE already spoken of this plant, when treating of tonics. It remains, therefore, in this place, only to notice its narcotic powers—powers which it possesses to a very considerable degree, "and capable of producing all the phenomena of opium." The flowers are the only parts used in medicine, although the leaves are not without some anodyne properties. A pillow of hops is a very common mode of procuring sleep in domestic practice. The narcotic principle of the hop seems to be particularly applicable to those cases where want of sleep and restlessness are kept up by an irritable state of the nervous system, and where opium cannot be taken from idiosyncrasy. It may be given in the form of an extract or of tincture. The tincture is made by infusing five ounces of hops in two pounds of proof spirits. The dose of this is from one drachm to half an ounce. The extract is given in the dose of from ten grains to two scruples, pro re nata.

The active powers of the hop reside almost exclusively in a peculiar pulverulent substance found between the scales of the hop. To this substance the name of *lupulin* has been given by Dr. A. W. Ives, of New York. Lupulin has the peculiar odor and taste of hops, and is of a yellowish color. It is composed

of resin, a bitter principle, tannin, extractive, a volatile oil, wax, and lignin. The resinous portion is by far the most abundant component part. According to M. Chevalier, two hundred parts of lupulin contain one hundred and five parts of resin. It is supposed, however, that the medicinal powers of this substance (lupulin) reside in its volatile oil and bitter principle. The dose is from eight to sixteen grains. I have repeatedly resorted to the use of lupulin, as an anodyne and soporific, and generally with excellent effects. It is peculiarly useful in certain irritable and nervous states of the system, where opium cannot be employed on account of its disagreeable effects. In chronic hysteria, attended with morbid vigilance and painful sensation in the abdomen, I have known the lupulin, administered in ten grain doses every six hours, to procure great relief, without causing any unpleasant feelings whatever.

HYOSCYAMUS NIGER.—HENBANE.

This plant is everywhere found in abundance on the continent of Europe. Its root bears a considerable resemblance to that of the parsnip, and fatal mistakes have happened by taking the former root for the latter. The taste of this plant is nauseous and slightly acrid, and its odor, which is almost wholly lost on exsiccation, stupefying. It contains a resin, mucilage, extractive matter, gallic acid, some salts, and, according to some chemists, an alkaline element, which has received the name of *hyoscyama.**

Both alcohol and water extract the narcotic powers of hyoscyamus very freely; boiling water, however, destroys them. The best menstruum is diluted alcohol.

The whole plant acts as a poison on the human system; but sheep, deer, and some other animals eat it with impunity.

Taken in a very large dose, it occasions a hard, small, and irregular pulse, anxiety, headache, vertigo, diminution of sensibility, intoxication, a sensation of falling downwards, even when in a recumbent position, delirium, coma, apoplexy, double vision, or entire loss of sight, subsultus tendinum, convulsions, risus sardonicus, paralysis of the tongue, a blue color of the face and whole body.† Alibert states that a gangrenous eruption on the skin, particularly of the lower extremities, is sometimes a consequence of a very large dose of this substance. Orfila says, that two persons who had eaten some young shoots of hyoscyamus dressed with oil, were, according to the report of M. Choquet,

* Paris's Pharmacologia.

† Burdach, Arzneimitellehre, B. iii. s. 525.

affected in the following manner: dilatation of the pupils, difficulty of breathing, pulse small and intermitting, aphonia, trismus, risus sardonicus, loss of sense, which, connected with a strong propensity to sleep, exhibited a complete state of typhomania. The extremities became cold; the superior ones were agitated; the inferior paralyzed;* and to these symptoms were added a deep carphologia.

In its remedial properties it approaches a good deal to those of opium. It differs, however, from this substance in heating the system much less, and in acting as an aperient on the bowels. It may, therefore, be employed with advantage where we wish to allay pain and irritation, and where opium is inadmissible on account of its stimulating and constipating properties.

Storck, Mayerne, Greeding and others regarded it as possessing very considerable curative powers in epilepsies, convulsions, and other spasmodic affections. Later experience, however, does not confirm these favorable sentiments of its virtues.

It is highly recommended by Bree as an antispasmodic in some cases of asthma.† In union with camphor, Dr. Gooch recommends the extract of hyoscyamus, in the dose of ten grains each, as one of the most useful anodynes in mania and melancholia;‡ and Richter states, that he succeeded in curing an obstinate case of this disease, after many other remedies had been tried ineffectually. He gradually increased the dose until the quantity of the extract taken, in twenty-four hours, amounted to one drachm. Hyoscyamus has also been employed in hooping-cough. Armstrong, Lentin, Butter and Fleisch (Kinderkrankheiten, B. ii. p. 431) administered it to infants for this purpose, with very evident advantage. Rodemacher strongly recommends this narcotic as a remedy for spasmodic colic; and Stoll asserts, that even in colica pictonum, it is capable of procuring great relief when given in large doses. (Mohrenheim's Contributions to Pract. Med., vol. i. p. 87.)

In hemoptysis attended with great irritability of the system,

* Toxicology, p. 256.

† His formula is this:

℞.—Tinct. scillæ	gtt. x;
Acidi nitrici	gtt. vi;
Extract. hyoscyam.	gr. iii;
Aq. fontanæ	℥iss.

Misce. Fiat haustus, horis tertiis vel quartis durante paroxysmo repetendus.

‡ Observations on Puerperal Insanity. In the sixth volume of the Trans. of Lond. College of Physicians. 1820.

and a violent spasmodic cough, olive oil, in which a certain portion of hyoscyamus has been boiled, is recommended by Richter* and others, as a very efficacious remedy. Borda speaks strongly in favor of the virtues of this article in spasmodic and inflammatory coughs, whether the result of protracted peripneumony or arising from nervous irritability.†

In tic douloureux, hyoscyamus niger, in combination with valerian and the sublimed oxide of zinc, has been greatly praised. It was used, as we are informed, with much success by Dr. Meglin, of Colmar, in France. Hufeland, also, speaks favorably of its powers in this painful affection. Breiting, also, has published cases illustrative of the good effects of this article in neuralgia. He administered it in very large doses, together with small portions of calomel. In chronic hysteria, particularly in cases attended with nervous pulse, active and full pains, and a very important benefit may often be derived from this remedy. Joerdens (Hufeland's Journ., vol. xxvii. p. 130) found it particularly beneficial in cases of hysteria, or great nervous irritability, attended with morbid vigilance.

I have known very decided benefit to result from the use of large doses of hyoscyamus, in conjunction with camphor, in mania-à-potu. I have given fifteen grains of the extract, with six grains of camphor, every two hours, in cases attended with a moderate grade of arterial reaction, with much advantage.

The leaves form an excellent anodyne cataplasm, and the smoke from its seeds, when applied by a funnel to a carious tooth, is recommended in severe fits of odontalgia.

The infusion of the leaves is frequently employed by the Germans as an enema, in spasmodic colic, painful hemorrhoidal tumors in the rectum, ulcers of the rectum, spasmodic retention of urine, painful enlargement of the prostate gland, dysuria, and dysmenorrhœa. This narcotic is, moreover, often used for the purpose of dilating the pupils.

Cullen thinks that this substance is more apt to produce delirium than opium. This accords with my own experience. I once

* Richter gives this formula:—

℞.—Ol. hyoscyam. coct. ℥ss;
G. mimos. ʒvi;
Syrup. althæ ℥i.
Misce intem. et. affund. sensin.
Aq. cerasor. nigr. ℥vi.
M. S. A tablespoonful every hour.

Richter's Specielle Therapie, vol. ii. p. 296. Harles, in Hufeland's Journal der Pract. Heilkund, vol. ix. No. 2, p. 56.

† Primæ Linæ of S. Borda.

prescribed the extract to an extremely nervous female; the first dose, which amounted only to one grain, produced the most perfect delirium. In another case I observed similar effects, though much less powerful. This article is employed either in the form of tincture or extract. The extract is given from gr. ss. to as much as the patient will bear. The tincture, made in the proportion of ℥ii, ʒii of the dried leaves of the plant, to lb. i of proof spirit, may be taken in the dose of gtt. to ʒi.

The active properties of hyoscyamus vary very much at different periods of its growth. The leaves should be collected soon after the flowers have withered, or rather about the time they are withering. Those of the second year are said to be much superior, in efficacy to those of the first.

Formulæ.

℞.—Aq. fœnicul. ℥iss;
Magnes. albi ʒi;
Nitrat. potass. ʒss;
Extract. hyoscyam. gr. ii;
Syrup. zingiber. ℥.—M. S. Dose, a teaspoonful every three hours for an infant. Hufeland strongly recommends this mixture, in the convulsions of children from intestinal irritation.

℞.—Nitrat. potassæ gr. x;
Pulv. cort. cinnamom. gr. vi;
Extract. hyoscyam. gr. ii;
Pulv. ipecac. gr. ss.—M. S. This is to be taken every two or three hours. Jahn employed it with much success in hemoptysis attended with quick and contracted pulse.

℞.—Extract hyoscyam.,
Flor. zinci, āā ʒss;
Magnes. carbonat. ʒiss.—M. From six to ten grains of this are to be taken two or three times daily in chronic hysteria.

℞.—Extract. colocynth. ℈ii;
——— hyoscyam. ℈i.—M. f. pil. No. xii. Brande recommends one pill to be taken at night, in habitual costiveness.

CONIUM MACULATUM.—HEMLOCK.

This is a very ancient article of the materia medica. The extract of cicuta is mentioned by Dioscorides, as "multiplicis in medicina usus." It does not appear, however, that it was used internally either by the Greek or Roman physicians. As an external application it was employed in phagedenic and other ill-conditioned ulcers; but its introduction into practice as an inter-

nal remedy did not take place until near the middle of the eighteenth century.

"There is no instance," says Dr. Cullen, "in which the fallacy of experience appears more strongly than in the history of this article." Storck, speaking from his own experience, alleged that it is the most efficacious remedy we possess for the cure of various glandular diseases.* Dr. Cullen, however, and since his time, physicians in general, have not found it to answer the high expectations which the experiments of Storck were calculated to excite. Still it must be confessed that it is an article of strong powers, and capable, under certain circumstances, in a variety of diseases, of doing a great deal of good. Even Cullen admitted its occasional valuable effects. "We have known it," says he, "useful in healing ulcers, which had come upon scirrhous tumors, and which continued to be surrounded with such scirrhosity; and in some ulcers certainly that approached to the nature of cancer. Even in cases that might certainly be considered as truly cancerous, I am so far from being of the opinion of Bierken, of its rather aggravating the disease, that I have found it in several cases to relieve the pains, and mend the quality of the matter proceeding from the sore, and even to make a considerable approach towards healing it; though I must own I never was concerned in a cancerous case in which the cure of the sore was completed."† Dr. Chapman‡ is, therefore, wrong in asserting that "its utility has been denounced by Cullen." He gave it all the credit which can be conceded to it at the present day. He, however, justly regarded the praises of Storck as extravagant; a judgment which is fully confirmed by general experience.

The leaves of this plant possess a strong narcotic odor, and are slightly bitter and nauseous to the taste. Exsiccation destroys their acrid quality, without lessening, in the least, their narcotic principle. Water distilled from the leaves, acquires the peculiar odor and taste of the plant, but is almost entirely destitute of narcotic virtues. The decoction is nearly tasteless, "and the extract resulting from it by evaporation" acts but very feebly on the system. Alcohol and ether extract the narcotic properties of the leaves readily and completely. The ethereal extract is of a fine dark green color, possessing the taste and smell of the plant, and is so active that half a grain of it will generally

* Ant de Storck Libellus, quo demonstratur cicutam non solum usu interno tutissime exhiberi, sed esse remedium valde utile in multus morbis. Vindobon. 1760, 8vo. Ejusdem Libellus secundus. 1761. Ejus Supplement. necessarium de cicuta, 1761. Cum tabulis 8.

† Cullen's Mat. Med., vol. ii. p. 189.

‡ Elements of Therapeutics, vol. ii. p. 239, first edition.

produce headache and vertigo. "Dr. Paris has prematurely proposed for this extract the name of *conein*, as it has no claim to be considered the active principle, which is only one of its ingredients."—(U. S. Dispensatory.) Hemlock has not yet been satisfactorily analyzed. According to Schrœder, the leaves contain resin, extractive, gum, albumen, a green fecula, and various salts. Braude obtained, besides the ingredients just mentioned, an oil possessing a very strong odor, and a peculiar alkaline principle, of a nauseous taste, and strong narcotic smell. This substance is insoluble in water, and is so active in its narcotic powers, as to occasion intense headache and vertigo, in half grain doses. The names of *cicuta* and *conia* have been given to this principle, though the latter term is now most commonly employed.*

When taken in a moderate dose, it produces no sensible effects, except vertigo and slight pain of the head. Taken, however, in a very large quantity, its effects are of the most violent kind. Anxiety about the præcordia is first felt; this is immediately followed by vertigo, great pain of the stomach, convulsions, discharge of blood from the mouth and ears, loss of sense, and trismus. The effects of an ordinary dose of this narcotic generally commence in thirty minutes after its reception into the stomach, and continue usually about twenty-four hours.

As a remedial article, cicuta admits of pretty extensive application. It appears, however, to be now almost universally admitted, that very little of any advantage can be expected from it in the treatment of genuine cancer. Alibert† states, that of more than one hundred women affected with scirrhous cancer of the uterus, and other parts of the body, who were treated with this remedy, in the Hospital Saint Louis, not one received the least benefit. In glandular indurations of a scrofulous character, however, this narcotic has frequently afforded a very decided benefit.

In chronic intumescence of the uterus, cicuta has been found very beneficial. Récamier (Gazette de Sante, 1825, No. 42) gives an account of a case of this kind, which was successfully treated with this remedy, in conjunction with a spare and simple diet. Wenzel also employed the cicuta with decided advantage in enlarged uterus, attended with occasional transient pains in

* The conia is obtained by digesting the plant for three or four days, in alcohol, filtering and evaporating the tincture, treating this extract with water, then adding magnesia, alumina, or oxide of iron, and evaporating the whole to dryness. This residue is to be submitted to the action of a mixture of ether and alcohol. The solution thus obtained yields the *conia* by evaporation.

† Elémens de Thérapeutique, vol. i. p. 412.

the pelvis. (Wenzel on Diseases of the Uterus, 1816.) In union with small portions of tart. antimony, or of the muriate of mercury, cicuta has been used with excellent effects in chronic enlargement of the spleen, or of the pancreas. Dufresnoy states, that he has employed this remedy in cases of dropsy from enlargement of the spleen or liver, with very great benefit. In scrofulous ulcers, also, cicuta is a remedy of value; and when united with minute doses of muriate of mercury, it forms an exceedingly useful medicine in almost every species of old and obstinate ulcer.*

Dr. Percival has published some interesting cases of the good effects of hemlock in internal ulcerations.† Dr. Odier, of Geneva, also gives an account of a most distressing instance of obstinate ulceration in the œsophagus effectually cured by this remedy. His patient commenced with a small dose, and gradually increased it to the extent of eighty grains a day.‡ Dr. Rutty, in a letter to Dr. J. Fothergill, gives the result of a large experience with this article, in the treatment of scrofulous and other malignant and corrosive ulcers; and it appears from this statement, that it is a remedy from which we may frequently expect important advantages in such cases.§ Dr. J. Fothergill also states, that he has often used it with success in sanious ulcers with gleety and painful discharges of the vagina.‖

It is a medicine of very considerable powers in allaying morbid irritability. As a palliative for quieting pulmonary irritation, Dr. Paris considers it by far the most efficacious remedy we possess. Although my own experience does not allow me to speak so favorably of its virtues in this way, yet I have witnessed in several instances its soothing effects in troublesome coughs. Dr. Donald Monro states that a deeply consumptive young lady took six grains of the extract of hemlock every night on going to bed, and that it always procured her rest, without heating her, or producing the uneasiness invariably felt from the use of opium. In chronic bronchitis, attended with a copious purulent expectoration, I have derived signal advantage from the employment of the extract of cicuta in conjunction with the acetate of lead. Two grains of the former, with a grain of the latter, may be given twice or thrice daily.

* Gataker. Essays on Medical Subjects, with an Introduction relating to the use of Hemlock and Corrosive Sublimate, &c., in Cancerous Disorders. Lond. 1764.

† Bibl. Brit. Sc. et Arts, vol. xxxviii. p. 58.

‡ Manuel de Médecine Pratique, p. 60, in a foot note.

§ Med. Observ. and Inquir., vol. iii. p. 229.

‖ Ibid., vol. iii. 418.

In phthisis pulmonalis, hemlock has, indeed, been particularly recommended as a palliative by many eminent writers. Richter declares that, both in the early and advanced stages of the disease, he has derived unequivocal benefit from the employment of this narcotic. It is said to be particularly useful when the expectoration is fetid, thin, or of an ichorous character. Adair, also, speaks very favorably of the effects of this remedy as a palliative in this disease; and Hufeland (Journ., B. lviii. p. 89) states, that he has known it to afford marked relief in cases of this kind. He commenced by giving five grains of the extract three times daily, and gradually increased the dose until it caused considerable vertigo, nausea, and tremor of the extremities. "No other remedy," he says, "excels this narcotic in allaying pulmonary irritability and irritation." It should, however, be given in very large doses when used for this purpose. He recommends the following mixture.*

Cicuta has also been found serviceable in syphilis. Hunter recommends it, combined with mercury, in indolent buboes and swelled testicle. In syphiloid chancres, of an irritable and spreading character, cicuta, given in very large doses, will often do much good. In an extremely troublesome case of this kind I have lately obtained prompt and effectual relief from exhibiting this substance with the nitrate of silver. For many years past, I have very seldom treated a case of syphilis without employing this narcotic. My usual mode of prescribing it is in union with corrosive sublimate, in the proportion of two grains of the extract with one-eighth of a grain of the mercurial. This dose is to be taken three times daily. In old syphilitic ulcers and cutaneous eruptions, I have employed this combination with more satisfaction than any other remedy I have used.

Narcotics were formerly much resorted to in the treatment of insanity. It seems, however, to be pretty generally admitted at the present day, that they can afford but little benefit in the diseases of the mind. Examples, however, do occasionally occur, of the beneficial operation of this class of remedies in mental diseases. The records of medicine, too, furnish us with proofs of their occasional efficacy in such affections; and we are, therefore, not permitted to regard them as entirely useless in this respect. Dr. Anthony Fothergill, of Bath, has recorded several instances of the successful employment of cicuta in the treatment of insanity.

I have employed it a good deal in the treatment of chronic

* ℞.—Ext. cicut., ext. hyoscyam., āā ℈ii; mucilag. g. Arab. ʒii. Tere simul, et adde: Liq. ammon. acetat. ʒi; aq. fontan. ʒiv; vin. ipecac. ʒi; syrup. ʒss.—M. Dose, a tablespoonful three times daily.

rheumatism, and I am satisfied, that, if given in strong doses, it will often afford useful results. It is, however, much inferior, in this respect, to stramonium, of which I shall presently give an account.

Cicuta has also been resorted to with success in tic douloureux. Dr. Fothergill* speaks well of its efficacy in this disease. Dr. Jackson, of Boston, has also published cases in which the good effects of this article are strikingly illustrated.† Thilemus gave cicuta in full doses, together with the volatile tincture of guaiacum, in a case of neuralgia of the face, with prompt and entire success; and Jahn (Mat. Med., vol. i. p. 592) administered it in conjunction with gum guaiac, assafetida, and calomel, with an equally favorable result. We have also the testimony of Pugol, Jackson, Gessner, Hufeland, Masius, and Siebold, in favor of the occasional efficacy of this narcotic in neuralgic affections.

Dr. Butler‡ has strongly recommended this medicine in the treatment of hooping-cough. His extravagant praises of this article have, however, never been confirmed by other practitioners. I have used it very frequently, but never with any decided advantage. Belladonna is so greatly superior to the cicuta, in this disease, that it deserves a preference, perhaps, in all instances where a narcotic is wanted.

The cicuta has also been employed in asthma; but it does not appear that it deserves any attention for its remedial powers in this disease. The same may be said of its use in epilepsy, chorea, and hysteria. In chronic cutaneous eruptions, particularly in herpetic and leprous affections, decided relief has been obtained from the employment of this narcotic. Gessner used an infusion of the leaves, as a topical application, with entire success in a case of inveterate itch. (Med. Beobachtungen, p. 204.) Strune states that, in conjunction with great abstemiousness in diet, or what the Germans call *hunger-cure*, he has administered the cicuta in obstinate and long-standing cases of herpetic eruptions, with the happiest result. Stuive also resorted to this mode of treatment with complete success, in a case of inveterate leprous psora.

In the cure of jaundice the powers of this article seem to be better established. Dr. J. Fisher, of Beverly, Massachusetts, has found it an exceedingly successful remedy in that variety of this disease which is occasioned by a spasmodic contraction of the biliary ducts. Drs. Bigelow and Jackson, of Boston, give their testimony in favor of this article in the cure of this disease.

* London Medical Observations and Inquiries, vol. v.

† New England Medical Journal, vol. ii. No. 2.

‡ A Treatise on Kinkcough, with an Appendix on Hemlock, by Wm. Butler, M. D., Lond. 1775.

"When the dose is gradually increased until its effects are distinctly felt in the head and stomach, the yellowness of the skin and eyes, in most cases, begins to disappear by the second day, and the disease is soon removed."*

Gudet (Jour. de Méd., vol. xii.) asserts that cicuta possesses the power of greatly diminishing the secretion of milk; and Richter recommends its use where this secretion is too copious, or during weaning.

In whatever disease this remedy be given, it ought to be used in large doses. Dr. Fothergill has published some excellent observations on this subject. He observes, that its efficacy will always depend on its being given in as large a dose as the patient can bear. It should be given in sufficient doses to produce some obvious effect on the system.

Vertigo seems to me the most certain mark by which to judge of the necessary influence of the medicine; and it is probable that we can never derive any decided advantage from its use, unless we give it to the extent of producing this effect.

Not a little of the contradictory experience which has been published with regard to the remedial powers of this article, may, perhaps, be ascribed to the great diversity which it exhibits in its strength as it is found in the shops. M. Orfila instituted a set of experiments with a view of ascertaining the comparative strength of the extract of hemlock properly prepared, and that which is usually sold in the shops. A drachm of this article prepared by himself was sufficient to poison a dog, whereas it required an ounce and ten drachms of that obtained from the shops to produce the same effect.† The extract is given in the

* Thacher's Dispensatory, p. 196.

† Orfila gives the following directions for preparing extracts:

"1. The plant must be taken when in full vegetation, and the flowers completely developed. Dried leaves treated with water, are perfectly useless.

"2. The juice is to be expressed, if the plant be succulent; if it be not succulent, water must be added, and then expression employed. In both cases expression is to be without heat.

"3. The juice thus obtained is to be evaporated by a gentle heat in a very broad vessel, and in a water bath. When thus prepared the extract of hemlock is of a gold yellow and slightly reddish color, whereas in the shops it is usually black."

In the tenth volume of the London Medico-Chirurgical Transactions, Mr. J. T. Barry gives a communication concerning a new mode of preparing pharmaceutical extracts. He evaporates the expressed juice in vacuo. Professor Jænisch, of Moscow, about the same time, proposed a similar mode for preparing such extracts. The superior quality of extracts made in this way must be obvious.

dose of two or three grains, and gradually increased until some effect is produced. The powdered leaves, which, if good, have a fine lively green color, are to be given in the dose of gr. iii, and increased until their influence becomes manifest. "Vinegar is considered its best antidote."*

Hemlock has been mistaken for the following plants: chærophyllum bulbosum and silvestre, æthusa cynapium, cicuta, virosa, scandens odorata, caucalis anthriscus, and the common parsley. It is distinguished by the ferruginous spots on the stalks.

Formulæ.

℞.—Extract. cicutæ ʒi;
Muriat. hydrarg. gr. iv.—M. Divide into thirty pills. Dose, one three times daily in scrofulous and syphilitic affections.

℞.—Tart. antimon. gr. x;
Sapon. med. ʒiii;
G. assafœtid. ʒi;
Extract. cicutæ ʒiss.—M. Divide into two grain pills. Dose, four or five three times datly.

℞.—G. assafœtid. ʒii;
Extract. cicutæ ʒiss;
——— aconit. ʒss;
Submuriat. hydr. ℈i.—M. Divide into two grain pills. Dose, four three times daily, in visceral indurations.

ATROPA BELLADONNA.—DEADLY NIGHTSHADE.

This is an European plant, and an exceedingly energetic narcotic. Its leaves are inodorous and of a slightly nauseous, sweetish, subacid taste. It does not appear that they lose any of their peculiar properties by drying. According to the analysis of Vauquelin, this plant contains an albumenoid substance, salts with a base of potash, and a bitter extractive principle, in which the active properties of the vegetable reside. It appears, from recent experiments, to contain also an alkaline element, to which the name of *atropia* has been given. The whole plant is extremely active. The berries, however, seem to be more intensely poisonous than the other parts; "and from their beautiful and inviting appearance they have often tempted the unwary" to fatal mistakes. In the Journal de Sedilot, Decembre, 1813, p. 364, there is an account given by M. E. Gaultier de Claubry, of the symptoms experienced by upwards of a hundred and fifty soldiers who were poisoned by eating the berries of this plant.

* Paris. Orfila.

They were affected by the following symptoms: "dilatation and immobility of the pupil; insensibility, almost complete, of the eye to the presence of external objects; or at least, confused vision: injection of the conjunctiva by a bluish blood; protrusion of the eye, which, in some, appeared dull, and in others, ardent and furious; dryness of the lips, tongue, palate, and throat; deglutition difficult, or even impossible; nausea not followed by vomiting; sensation of weakness; lipothymia, syncope; difficulty or impossibility of standing; frequent bending forwards of the trunk; continued motion of the hands and fingers; gay delirium, with a vacant smile; aphonia, or confused sounds, uttered with pain; ineffectual desires of going to stool; insensible restoration of health and reason, without any recollection of the preceding state."*

Alibert states, that in three children who had eaten the berries of this plant, nausea immediately came on; the pulse became feeble and irregular, and a delirium of the most singular character supervened. They cried, sang, and laughed alternately, and exhibited the most ridiculous and apparently involuntary gestures; the whole body was in agitation, and the countenance haggard and fixed.†

The effects of a full dose of this narcotic in healthy individuals are: a sense of weight and fullness in the head; ringing or a buzzing noise in the ears; dilatation of the pupils; a somewhat accelerated pulse; increased temperature; flushed face, and generally a diffused redness over the whole surface of the body; diminution of the appetite; a feeling of dryness of the mouth, fauces, and œsophagus, and much thirst. After these symptoms have continued for three or four hours, they begin to abate, at the same time that the perspiratory and urinary secretions are increased. In a still greater dose, it gives rise to a sensation of constriction, attended with an extremely annoying dryness of the œsophagus, and difficulty or even impossibility of deglutition; burning and spasmodic pains in the stomach, and often vomiting; a feeling of great fullness and weight in the head, vertigo, drowsiness, dullness, and confusion of the mind, with more or less delirium and visual illusion. A further increase of the dose will give rise to the extremely violent and dangerous effects mentioned in the preceding page.

Belladonna possesses very important remedial powers. By some it has been a good deal praised for its virtues in the cure of cancer. Cullen's success with this article, as he informs us, was

* Orfila's Toxicology, p. 286, Dr. Nancrede's translation.

† A. M. Giraudy has written a dissertation entitled, "Le délire causé par la Belladonna, a-t-il un caractère que lui soit propre?"

various. He cured entirely a cancer of the lip with it. He also employed it with success in a scirrhosity of a woman's breast, and in an ulcer of a cancerous nature below the eye. In other cases, however, it proved entirely ineffectual. Alberti and Juncker speak favorably of it in scirrhus of the intestines and stomach. Haller, De Haen, Heister, and more recently Rhan, of Zurich, have, however, not only not confirmed these favorable accounts of the powers of belladonna in scirrhous and cancerous affections, but have, on the contrary, found it injurious in such cases. In glandular engorgements, and indurations of a scrofulous or ordinary character, great advantage may undoubtedly sometimes be derived from this remedy. Evers employed it in engorgements, and indurated tumors of the breasts, and in chronic intumescence of the uterus, with entire success. (Schmucker's Vermischt. schriften., Bd. iii. s. 242.) Dalruc also dissipated indurations of this kind, by the external and internal use of this article (Journ. de Med., vol. ii. p. 449); and Autenrieth declares that he has, in a considerable number of instances, derived very decided benefit from the external application of a strong infusion of belladonna to scrofulous tumors and swellings of the joints. (Richter's Spec. Arzneimittell., B. ii. p. 577.) A case occurred in the Polyclinic Institute of Berlin, which was regarded as an instance of indurated enlargement of the pyloric extremity of the stomach, and which yielded ultimately under the internal use of the extract of belladonna dissolved in diluted prussic acid. In scrofulous ulcers, this narcotic will occasionally produce the happiest effects. In cases of this kind, I have, in a few instances, employed the extract in conjunction with minute portions of the muriate of gold, with the most satisfactory result.

For the cure of hooping-cough, this remedy enjoys, at present, a very high character in Europe. Borda speaks in terms of unlimited praise of the advantages he has derived from it in this disease. Children, says he, to all appearance past recovery, have been saved by means of this remedy.* Hufeland, Schæffer, Kopp, Jahn, Henke, Richter, and Marc, speak of it in similar terms of praise. They consider it, indeed, as almost entitled to the character of a specific in this disease. Wetzler† is equally warm in its praise; and Alibert states, that in France a similar success has attended the employment of this remedy. I have prescribed it in about a dozen cases. In two of these, its good effects were prompt-

* Primæ Linæ.

† Wetzler recommends this remedy to be given in this way. Take of the powdered root, mix it with a sufficient quantity of sugar, and divide it into parts containing one-fifth of a grain each. This is a dose for a child under one year old, which must be repeated night and morning.

ly and strikingly manifested. In five or six, its advantages were much less obvious, and in a few it produced no change in the disease whatever. I apprehend, however, that the extract which I employed was not very good; it was old, dry, and black. From the very numerous and respectable testimonies we have in favor of its powers in this disease, it certainly has claims to attention in the treatment of this harassing and intractable affection. It may be conveniently administered by dissolving four grains of the extract in an ounce of sweetened water, and giving from eight to twelve drops three times daily, to a child under two years old. As the extract, however, is of uncertain strength, the powdered root is preferable. It may be given in doses of from one-sixth to one-half of a grain three times daily, according to the age of the child. Lenhosock says, that he has never found it necessary to give more than one-fourth of a grain in twenty-four hours. When the dose is too large, it is apt to produce vehement arterial excitement, and a general erythematous rash over the surface of the body, which, however, seldom continue more than two or three hours.

This article ought to be administered with great caution to robust, plethoric and irritable subjects, or to such as are predisposed to strong determinations of blood to the head. It is seldom found beneficial in hooping-cough, but often decidedly injurious, when inflammatory or febrile symptoms are present.

According to Mr. Q. Bailey's experience, belladonna is the most efficacious remedy we possess in tic douloureux.* He records many cases of extreme violence, which were effectually cured by this remedy, after every other mode of treatment had been tried without success. He usually exhibited from two to three grains of the extract, or from twenty to thirty minims of the tincture every four or five hours, while the paroxysm was violent, and in smaller doses when the pains were mitigated. He informs us that the employment of this remedy sometimes produces vertigo, impaired vision, insensibility, tightness across the breast, and a sense of suffocation and dryness in the throat; but these effects do not continue long, and have never been observed to leave any unpleasant consequences.

It has been much spoken of by some German writers, as a remedy for hydrophobia.† Mr. Munch, of Hanover, and Bucholz, of Weimar, speak of their success in this way. Burdach also speaks favorably of its powers in this frightful disease. It is,

* Observations on the Use of Belladonna in Painful Disorders of the Head and Face. London, 1818.

† T. H. Münch kurze Anweisung wie die Belladonna in tollen hund biss Anzuwenden ist. Gottingen, 1783.

however, but too certain that all such hopes are fallacious, and that we are yet entirely without any effectual means for arresting its dreadful and fatal course.

By some physicians this remedy has been a good deal extolled for its powers in epilepsy. Greeding, Hufeland, Stoll and Mayerne have published observations favorable to the employment of belladonna in this disease. Subsequent experience has not confirmed these expectations.

The belladonna has also been employed in mania and melancholia.* It is said to be particularly applicable to cases consequent to a suppression of some accustomed evacuation, or the repulsion of cutaneous eruptions. I know nothing of its powers from my own experience in these affections. That they are but inconsiderable, may be inferred from the almost total neglect of this article in the treatment of these diseases.

Belladonna has been recommended as a valuable remedy in paralysis, more especially of the extensor muscles. Richter says, that in affections of this kind this remedy has been too much neglected; and Jahn (Klinik. p. Chron. Krankh., vol. i. p. 365) declares, that cases which do not yield to this remedy, may be regarded as incurable. Schmucker used the belladonna with success in hemiplegia, and Selle cured several cases of paralysis of the tongue by its use. It has also been successfully employed in some cases of local palsy by Verschuir (Gerson and Julius' Journal d. Auslaend Med. Literat., vol. vi. p. 57).

Mr. Bailey† states, that in a violent case of hysteria, which had withstood all other remedies, the efficacy of this article was conspicuously shown. I have employed the tincture of this plant in chronic hysteria with unequivocal advantage. It is particularly beneficial in cases attended with pain in the stomach and bowels. In chlorosis, also, unattended with febrile irritation, the use of the tincture, in conjunction with the prussiate of iron, has in several instances appeared to me of material service. It has also been recommended in other spasmodic diseases, such as chorea, asthma, spasmodic ischuria, dysphagia, &c.

Burdach speaks of its successful employment in amaurosis, sciatica, loss of speech, and hemiplegia.

The belladonna, in common with some other plants of this class of remedies, possesses the property of dilating the pupils of the eyes in a remarkable manner, whether it be taken internally, or only applied upon the external parts of the eyes. Advantage is taken of this property to dilate the pupils, in order to facilitate

* Observationes practicæ circa usum Belladonnæ in Melancholia, Mania et Epilepsia. J. H. Münch. Götting. 1783.

† Observations on the Use of Belladonna.

certain operations on the eye, as coughing, &c. It has also been employed as a local application, to relax the mouth of the womb when too rigid in parturition. Dr. Conquest (Lond. Med. Reposit., vol. xiii. p. 75) states, that in a case of this kind, he injected a strong infusion of belladonna into the vagina, which was speedily followed by complete dilatation of the os uteri. Chaussier employed for this purpose an ointment composed of two drachms of the extract, and an ounce of lard, which he applied to the mouth of the womb, and he asserts that even when applied to the vulva and lower part of the vagina, it will often, in a short time, cause complete relaxation of the os uteri. He declares, that for fifteen years, he has, in nearly every case of rigidity of the os uteri which occurred in his obstetrical practice, resorted to this application, and that it almost uniformly had the desired effect in less than forty minutes.

We have also the testimony of Henne (Rust's Repertor., vol. xiv. p. 137), of Mandt (Rust's Magazine, vol. xix. p. 350), and of Vogt (Pharmakodynamik, vol. i. p. 133), in favor of the usefulness of this narcotic in difficult labor, from rigidity of the os uteri.

Hufeland states that he has been in the habit of employing the fumes of narcotic plants, in convulsions, epilepsy, and other nervous affections, with very considerable success. He takes equal portions of belladonna and hyoscyamus, with a few grains of opium, and exposes them to the heat of an alcoholic lamp on a thin iron plate in a vapor bath. The patient remains in this bath from fifteen to twenty minutes, care being taken that the fumes do not reach the face. The immediate effects are copious perspiration, succeeded, commonly by a sense of fullness, and occasionally also with tremors, vertigo, difficulty of breathing, and very rarely spasms. Hufeland gives an account of twelve cases of epilepsy, all of which were cured in this way.*

A great deal has of late years been written concerning the alleged prophylactic powers of belladonna against scarlatina. It is said that the internal administration of this narcotic will, in a vast majority of instances, protect the system completely against the influence of this contagion. Its prophylactic powers, in this respect, were first noticed by Hahnemann. He asserts, that he has, in a great many instances, found it to afford entire protection against this disease in children who were much exposed to its contagion. Hufeland also employed it in a number of cases, and the result convinced him fully, that it possesses the power of preventing scarlatina. We have also the testimony of Brera, Kopp, Hedenus, Berndt, Behr, Wagner, Kœhler, Bloch, and many other

* Revue Médicale, 1822.

writers, in favor of its decided efficacy in this respect. When employed for this purpose, it should be administered in very minute doses. Hufeland directed three grains of the extract to be dissolved in an ounce of water, of which as many drops are to be given, three times daily, as the individual numbers years in age, that is, one drop to a child one year old, two drops to one two years old, &c.

The most convenient and effective mode of administering the belladonna is, by employing the powdered leaves or root. One grain of the powder of the leaves may be given to an adult morning and evening, and gradually increasing the dose to as much as can be borne. The root, if well dried, is somewhat stronger than the leaves, and must, therefore, be given in smaller doses. The extract is extremely variable in its strength. If good, it must be commenced with in the dose of gr. ss. An over-dose produces so great an insensibility of the stomach as to render it almost impossible to excite vomiting by the strongest antimonial emetics. Vinegar is accounted the best antidote to this poison. It renders the operation of emetics more certain and prompt.

Formulæ.

℞.—Tinct. belladon. ℥ss;
Tinct. scillæ ℥i.—M. Dose, from ten to twenty drops three times daily, to children between one and five years old, in hooping-cough.

℞.—Extract. belladon. ʒi;
G. assafœtid. ʒi;
G. aloes socc. gr. xv.—M. Divide into thirty pills. In chronic hysteria, one to be taken two, three, or four times daily.

STRAMONIUM.—THORN-APPLE.

This is a very common plant in this country, known familiarly by the names of Jamestown weed, thorn-apple, or stink-weed. It is a powerful narcotic, and has of late become of considerable importance for its remedial powers. It contains gum, resin, carbonate of ammonia, and an alkaline principle which has received the name of *daturia.**

On being received into the stomach in an over-dose, its effects are exceedingly violent. The pupils dilate very much; vertigo, delirium, tremors, retching, excessive thirst, mania, and convulsions come on. The mania is of a very singular character, being attended with the most antic gestures, screaming, laughing,

* Paris's Pharmacologia.

crying, and distorting the face continually. A deep coma comes on before death.

We are indebted to Baron Storck for the introduction of this powerful article into regular practice. He used it in mania, epilepsy, and other convulsive affections; and the result of his experience was much in favor of its remedial powers.* Sidren also adds his testimony in behalf of the efficacy of this remedy in convulsive diseases.† The experience of Wedenberg and Odhelius‡ was less favorable; nor has later experience, upon the whole, confirmed the hopes which the trials of Storck and others were calculated to inspire. The late Professor Barton, however, considered it "a medicine of great and valuable powers," in the treatment of mental, as well as other diseases. He advises large doses in mania. In one patient he carried the dose from two grains of the powdered leaves to sixty. "When the patient (a maniac) had continued upon this dose for some time, she broke out into boils, upon various parts of the body, and was at length discharged from the hospital cured."§ In an instance of hysterical mania, which came under my notice a few years ago, the employment of this remedy afforded unequivocal benefit. On the third day after the use of stramonium was commenced, the maniacal symptoms began to subside, and in a few days more, they were entirely removed. The disease had continued for upwards of three weeks before this remedy was resorted to.

This article has also been successfully employed in epilepsy. Dr. J. Fisher, a practitioner of high standing in Massachusetts, speaks very favorably of its employment in this disease occurring in young persons, and at regular periodical intervals. This article is more likely to prove beneficial when assisted by the simultaneous use of chalybeates. The patient should be kept under the constant influence of the medicine. He recommends the employment of a saturated tincture as most convenient for children. The dose is to be regulated by the dilatation of the pupil.

It has been used in chorea, tetanus, and palsy. I have never employed it in any of these affections; but I have no doubt, from its general properties, that, like many of the articles belonging to

* Ant. de Storck Libellus, quo demonstratur, stramonium, hyoscyamum, aconitum, non solum tuto posse exhiberi, &c. Vindob. 1762, c. iii. tab. 8.

† Sidren de Stramonii usu in morbis convulsivis. Upsal, 1772. In Baldinger's Sylloge, vol. ii.

‡ Wedenberg de Stramonii usu in morbus convulsivis.

§ Collection for an Essay towards a Materia Medica of the United States, p. 48.

this class, it may be occasionally found successful in such cases.* Kreysig treated a case of chorea successfully by exhibiting half a grain of the extract twice daily. This case was brought on by standing a long time in cold water. Odhelius, also, derived great benefit in cases of this kind from this remedy; and Hufeland employed the tincture, both in epilepsy and chorea, with evident advantage. (Hufeland's Journ., vol. ix. p. 91.)

Its chief importance, however, consists in the excellent effects which it produces in chronic diseases, attended with violent pain. Dr. Marcet is the first who noticed particularly its salutary operation in affections of this kind. "If I were called upon," says he, "to express in a few words the general opinion which I feel inclined to form from the opportunities I have had of studying the properties of stramonium, I should say that the most common effect of this remedy, when administered in appropriate doses,† in cases of chronic disease attended with acute pain, is to lessen powerfully, and almost immediately, sensibility and pain; to occasion a sort of nervous shock, which is frequently attended with a momentary affection of the head and eyes, with a degree of nausea, and with phenomena resembling those that are produced by intoxication; to excite, in many instances, nervous sensations which are referred to the œsophagus, or bronchiæ, or fauces, and which sometimes amount to a sense of suffocation; to have rather a relaxing than an astringent effect upon the bowels; to have no marked influence upon the frequency of the pulse, though, in a few instances, it has appeared to render it somewhat slower; to produce but a transitory and inconsiderable dilatation of the pupils, and to have but little immediate tendency to induce sleep, except from the state of comparative serenity and ease which generally follows the symptoms I have just described."‡

The diseases of this kind in which this remedy appears to be most efficacious, are chronic rheumatism, sciatica, tic douloureux, and the violent pains which sometimes attend cancerous affections.

Dr. Scudamore states that he has succeeded with it in relieving

* In the New-England Medical and Surgical Journal, vol. iv. p. 226, a singular case of spasmodic cough is reported, which yielded readily to the extract of stramonium, after a very great variety of other remedies had been tried in vain. The cough was attended with convulsions, subsultus tendinum, and other distressing nervous symptoms.

† From one-eighth of a grain to a grain a dose, which should not be exceeded until its effects have been observed.

‡ On the Medicinal Properties of Stramonium, &c., by A. Marcet, M. D., in the Medico-Chirurgical Transactions, vol. vii. p. 2.

gouty pains, dependent on or immediately connected with spasm. He found the stramonium more decidedly useful when given in combination with lactucarium. "From reflection on my experience," says he, "I am tempted to affirm that the former acts most as an anodyne, the latter as a sedative; and whenever both effects are desired, they will be most favorably procured from the union of the two preparations."*

I have employed stramonium in rheumatism and sciatica, and the result of my trials has been exceedingly flattering. It appears to me to be the most efficacious remedy we possess in those cases of chronic rheumatism which are attended by an irritable, quick, but weak pulse, swelled joints, and unattended by any great pain, unless on being moved. I have used it in three cases of sciatica within a year past, and in every instance with the most decided advantage.†

Dr. Marcet tried it in three cases of tic douloureux. One case was essentially benefited by it; in another its effects were equivocal, and in the third it failed entirely. Dr. Bigelow, of Boston, found it decidedly useful in a case of this kind.‡

I have employed the tincture of stramonium with excellent effects in dysmenorrhœa. By exhibiting from twenty to thirty drops of the officinal tincture three times daily, for two or three days immediately preceding the period of the menses, the distressing pains attending this affection will, in some instances, be entirely prevented. In one case it effected an entire cure.

Dr. Elliotson strongly recommends the use of this narcotic in spasmodic pain of the bowels (*enterodynia*), unaccompanied with febrile excitement, or the presence of irritating substances.

In asthma it has been much employed by smoking the root and dried leaves in a common tobacco pipe. I have prescribed the use of it in this way in a number of instances, and my patients have occasionally expressed themselves considerably relieved by it. In the East Indies, the root of the *Datura ferox* is regarded as almost a specific for the cure of spasmodic asthma. It is cut into thin chips, and smoked in a pipe. It appears, however, to possess extremely active narcotic powers. Richter states that he tried it in one instance, but was immediately obliged to lay it

* A Treatise on the Nature and Cure of Gout and Rheumatism, &c., p. 129.

† I have seen the stramonium employed in domestic practice for the cure of rheumatism, about twelve years ago, while practising in Lancaster county. I recollect that a rheumatic patient, upon whom I had in vain exhausted all the usual resources in this disease, was cured in less than two weeks by an old woman, who administered a saturated tincture of stramonium seeds, in the dose of a teaspoonful three times a day.

‡ Bigelow's American Medical Botany, vol. i. p. 23.

aside. In a few moments it produced stupor, vertigo, and confusion of mind. Ward, (Lond. Med. and Phys. Journ.,) however, employed a tincture of this species of datura, made by digesting four ounces of the leaves in fourteen ounces of alcohol, mixed with one ounce of caustic ammonia, with evident advantage in asthmatic affections. He gave from fourteen to twenty-four drops, once or twice daily.

An ointment made of the leaves of this plant frequently affords great relief when applied to painful and irritable ulcers, and hemorrhoidal tumors. Dr. Bigelow states that the stramonium ointment with the ointment of acetate of lead, forms one of the best applications in this affection.

Like the belladonna, it produces great dilatation of the pupils, when applied to the external parts of the eyes.

The following doses of the stramonium must be commenced with:

Of the powdered leaves, one grain;
powdered seeds, half a grain.
Of the inspissated juice or extract, one grain;
extract of the seeds, from one-fourth to half a grain;
tincture, from fifteen to twenty drops.*

ACONITUM NAPELLUS.—WOLFSBANE.

This is a powerful narcotic poison, and was well known as such to the ancients. Ovid alludes to its baneful properties, and the fatal purposes to which it was sometimes applied by the wicked.

Lurida terribiles miscent aconita novercæ.—*Metam.* i. 148.

There are four species of aconitum possessing pretty nearly the same powers. The aconitum napellus, cammarum, neomontanum, and tauricum, all of which are indigenous to the Alpine regions of Europe. The aconitum napellus is, however, almost exclusively employed in medicine. The juice of this species has a disagreeable smell and a nauseous acrid taste. According to the analysis of Bucholtz, the fresh root contains a green resin, albumen, a bitter and acrid extractive matter, with nitrates and acetates, gum, malate and citrate of lime. Brandes has discovered in the aconitum napellus, a peculiar alkaline principle, to which the name *aconita* has been given. The acrimony of the plant is almost entirely destroyed by exsiccation. When taken in excessive doses it produces sickness, giddiness, delirium, fainting, cold

* Bigelow's American Medical Botany, vol. i.

sweats, asphyxia, spasms, involuntary stools, apoplexy, and death. It has been known, on being introduced into a small wound of the thumb, to produce "pain in the fingers and arm, cardialgia, anxiety, with fear of suffocation, lipothymia, agitation, and finally, gangrene, and copious suppuration."* When the leaves of this plant are chewed in small quantity, they cause a sensation of numbness in the gums and lips, which continues for two or three hours.†

Aconitum has been a good deal employed in the practice of the German and Italian physicians; and it seems still to enjoy no inconsiderable reputation among them. Storck first introduced this article into regular practice. The character, however, which he gave it was, upon the whole, too flattering; and later experience has not fully confirmed the favorable account which he gave of its powers. There is, notwithstanding, sufficient testimony extant in its favor, to establish its claims to our attention; and I am led, independent of such testimony, from my own experience, to regard it as an article possessing valuable medicinal virtues.

It is often of decided advantage in rheumatic and syphilitic pains, consequent to a mercurial course. I have been in the habit, for several years past, of giving a dose of the extract of this plant, to such of my patients as are suffering from pains of this kind, as an anodyne, on going to bed, and I have often had reason to be satisfied with its effects. Borda,‡ an eminent Italian physician, commends its powers very highly in these affections. Richter says that, in acute rheumatism, after the fever had in a great degree subsided, but where much pain was still experienced in the affected parts, he has frequently known very decided relief obtained, from the use of a solution of the extract of aconitum in antimonial wine. One drachm of the extract should be dissolved in an ounce of the wine, and taken in doses of from fifteen to thirty drops every four hours. It has also been extolled for its virtues in chronic rheumatism and gout.§ In a case of the former of these diseases, I employed it in large doses, and derived some advantage from it. Its virtues appear to be much enhanced by being united with antimonials in cases of rheumatism. It is, however, so decidedly inferior to stramonium in this respect, that it may very properly be neglected for this latter remedy in these affections. Swediaur used this narcotic, with a very good effect, in gleet complicated with rheumatism.

* Orfila's Toxicology, by Dr. Nancrede, p. 220. Alberti Jurisprudentia Medica, tom. vi. p. 724.

† Brodie; in the Philosoph. Transact., An. 1811, p. 185.

‡ Primæ Linæ.

§ Bohmer de usu salutari extracti aconiti in Arthritide. Halæ, 1768.

Borda praises it as one of the most valuable remedies we possess, for relieving morbid secretions of the trachea and bronchia. "Crebro," says he, "etiam obstupui animadvertens extractum aconiti nedum sputorum redundantiam ocissime repellere, sed naturam eorum ita immutare ut mihi omnem præperceptum abstergeret metum proximæ desperatæ phthiseos cui mors quasi saxum Tantali impendent." Busch recommends this article as an excellent remedy in phthisis pulmonalis. It is said to be particularly useful in bronchial consumption, or chronic bronchitis. Baumes, also, speaks highly of its effects in this complaint. Both these writers say that this narcotic is most apt to prove beneficial when given in the first stage of the disease.

Burdach states that it has been applied successfully to the cure of obstinate quartans. It has also been used with advantage, according to the same writer, in amaurosis.

I need scarcely say, that its once reputed powers in the cure of cancer, are entirely fallacious. Yet, in the treatment of scrofulous, venereal, and other obstinate ulcers, it has been known to be of unequivocal advantage.* We have, also, accounts of its efficacy in goitre, scirrhous breasts, mesenteric obstructions, and nodes.

The aconitum is generally employed in the form of an extract. Half a grain is sufficient to commence with, if it be good, and gradually increasing the dose to as much as can be borne without inconvenience. The tincture is to be commenced with in the dose of gtt. xv, and gradually increased. Of the powdered leaves one grain is an ordinary dose.

Formulæ.

℞.—Tinct. guaiaci volat. ℥ii;
Extract. aconit. ℥i;
Vin. antimonii ℥i.—M. Take a teaspoonful three times daily, in chronic rheumatism.

℞.—Extract. aconit.,
Sulph. aurat. antimon., āā ℈ii;
G. guaiaci ʒiv.—M. Divide into two grain pills. S. Take four pills three times daily, in chronic cutaneous diseases.

℞.—Fol. aconit. ℥ii;
Liquor. anod. Hoff. ℥viii.—M. Digest for three days. This is a very active preparation, and may be employed with much benefit in chronic hysteria, with nervous pains in the abdomen. The dose is from fifteen to twenty drops, four times daily.

* Vogler recommends the following compound in the treatment of arthritic and rheumatic cases:

℞.—Succ. inspiss. aconiti napel.,
Antim. sulphuret. precip., āā gr. i;
Magnesia gr. x.—M. To be taken for a dose.

SOLANUM NIGRUM.

This is a very common plant in the United States, and generally found growing in gardens. It possesses a slightly fœtid odor; its taste is insipid and herbaceous. Alibert* states, that a boy aged eight years ate some of the black berries of this plant, which induced coma and torpor, attended with fever. He complained of great pain in the pit of the stomach, and was harassed with nausea and retchings. According to the experience of M. Dunal, it would appear that the extract of this plant is not very poisonous, but that it has the power of slowly destroying sensibility and irritability.† That the berries, however, are an active narcotic poison, I have had the most satisfactory evidence in a little girl, while I practised in Lancaster. Being called to visit this little patient, I found her lying in a deep apoplectic stupor—entirely insensible, all the muscles relaxed, the face flushed, and the pulse full and irregular. She continued in this state about six hours, and then gradually recovered. When she had become sensible again, it was ascertained that she had eaten of the berries of this plant.

M. Desforres, of Besancon, has obtained from this species of solanum, as well as from the solanum dulcamara, a peculiar alkaline principle, upon which the active properties of the plants appear to depend, and which has received the name of *solania*. This substance consists of a white, opaque, and sometimes pearly powder, without odor, and a slightly bitter, nauseous taste. It is insoluble in cold water, soluble in eight thousand parts of hot water, and sparingly in alcohol. Acids dissolve it speedily and afford a perfectly neutral solution. In doses of from grs. ii to grs. iv, given to dogs or cats, it excites violent retching and vomiting, followed speedily by drowsiness, which continues several hours. Eight grains did not destroy a kitten, although violent vomiting and stupor ensued. In the human subject, a very small quantity excited great irritation in the throat, accompanied with a very nauseous and bitter taste. Dissolved in acetic acid, which is said to be the best way for administering the solania, it may be given in quarter grain doses, two or three times daily. This solution almost always produces some degree of nausea, but no subsequent drowsiness.‡

The solanum nigrum was very early introduced into the materia medica. It was used among the ancients as an external

* Nouveaux Elémens de Thérapeutique, &c., tom. i. p. 417.

† As quoted by Orfila.

‡ Magendie's Formulæ, &c., translated by W. Darrach, M. D., of Phila.

application, either in the form of poultice or its expressed juice, in a great variety of diseases.* Cæsalpinus states that it was frequently employed as an internal remedy in inflammation of the stomach and bowels, and for ardor urinæ.† It had, however, fallen almost into entire neglect, until the attention of the profession was again called to it by M. Gataker, surgeon of Westminster Hospital, in a paper read to the Royal Society in 1757, and afterwards published in a separate work, under the title of "Observations on the internal Use of the Solanum, or Nightshade." The account which this writer gives of the medicinal properties of the solanum nigrum, is highly interesting, and, I conceive, in no degree exaggerated. He describes the following as its effects when exhibited in proper doses: "I found," says he, "from repeated trials, made with great caution, and safety to the patient, that so small a quantity as one grain weight of the leaf, infused in about an ounce of water, and the liquor afterwards strained from the leaf, and taken at bed-time, would sometimes have a considerable effect; but that two or three grains seldom failed either to vomit, sweat, or purge the patient moderately, or to increase the quantity of urine. It sometimes occasioned a giddiness, especially when it made the patient sick; but neither the sickness nor giddiness was a constant symptom; and when they happened, they generally abated or entirely ceased after the first dose. The most common effects that I have observed to ensue upon taking the medicine were, a heat or warmth diffused in a few hours over the body, a plentiful sweat succeeding this heat, and a purging the next day. If a sweat did not break out, an extraordinary discharge of urine was the consequence, and frequently followed likewise by purging. One or more of the natural evacuations were almost always increased."‡

The disorders, in the cure of which he found this plant to be more particularly advantageous, are, foul and painful chronic ulcers; pains in particular parts of the body; scorbutic eruptions, and ulcers of a cancerous nature. He relates a number of cases of each of these diseases, as having been successfully treated by this remedy in his own practice, and he gives some on the authority of others, equally favorable to its powers. From my own experience I am entirely convinced that the remedial virtues of this plant are by far too much neglected, and that they are capable, in certain cases, of affording important advantages. While practising in the country, I very frequently exhibited this species of solanum in obstinate herpetic eruptions, and foul and painful

* Dioscorides, lib. iv. c. 71.

† De Plantis, 213.

‡ Observations on the Use of Solanum, p. 8.

ulcers, and often with the most decided benefit. I have also employed it with much advantage in syphilitic eruptions attended with nocturnal pains. The dose, however, which I gave was much larger than that mentioned by M. Gataker. I commonly commenced with two grains of the dried leaves made into a pill, night and morning, and increased the dose until considerable nausea was excited, or until effects indicating its complete influence, such as vertigo, tremor, and debility, or pain in the stomach, arose.

As an external application it has been highly commended for the cure of erysipelas.

SOLANUM DULCAMARA.

The dulcamara is a native of Europe and of this country; though with us it is most commonly found cultivated as a garden shrub. It is a climbing plant, with woody, brittle stalks—it flowers in July, and bears red berries. The young twigs and leaves are the parts employed for remedial purposes, and should be collected early in spring.

It does not appear that this species of solanum was employed by the ancients as a medicine. It is not mentioned in the works either of Theophrastus or Dioscorides.*

The narcotic properties of this vegetable are much feebler than those of the plants I have already mentioned. It is not, however, destitute of active qualities; for when taken into the stomach in very large doses, it is capable of producing vomiting, spasms, delirium, convulsions and insensibility. Dr. Bigelow states that he has known the dulcamara, when collected in full vigor, to produce vomiting, in the dose of a few grains of the powdered leaves, or of a small cup of the decoction. It generally, too, acts pretty strongly as a diuretic, and its effects on the bowels are almost constantly aperient.

It is said to contain a larger proportion of the peculiar alkaline principle, *solania*, than the S. nigrum. This circumstance does not countenance the opinion that the narcotic properties of these plants depend on the solania; for, were this the case, the S. dulcamara, which contains a greater proportion of this substance than the S. nigrum, ought also to possess more active narcotic powers, which, however, is contrary to the results of experience.

This plant was formerly regarded as a very important remedy; and it is still thought by many to possess medicinal properties of very considerable value.

* Gataker on the Solana.

From what I have myself seen of its effects, I am induced to regard it as a valuable article. It is of unquestionable service in herpetic and syphilitic eruptions. Dr. Crichton, physician to the Westminster hospital, states, in a letter to Dr. Willan, that he has found only two cases out of twenty-three of lepra græcorum to resist the curative powers of the dulcamara.* Willan and Bateman add their testimony in favor of the utility of this remedy in the treatment of cutaneous diseases. The latter says, "One of the most effectual remedies in lepra, under all its varieties, is the decoction of the leaves and twigs of the solanum dulcamara."†

In the London Medical and Physical Journal, for May, 1830, Mr. Gardner has published a paper, in which he confidently asserts, that the solanum dulcamara, if properly administered, is a most valuable remedy in chronic diseases of the skin, more especially in those which are attended with much irritation, pustules, vesicles, scales, &c. In psoriasis, in several varieties of impetigo, in eczema and porrigo, as well as in lepra and ichthyosis, he declares that he has used this remedy with uniform success. "To insure success with the use of dulcamara, it is necessary that it should be collected at a proper time, and carefully dried; it should, when dry, yield a powder of a bright green color. The dose should be gradually increased until sickness, vertigo, and purging are produced. In no case have I known any benefit to be derived from its use, unless symptoms of its influence on the system were produced. The decoction, to be good, should be of a dark green color, depositing a copious sediment as it cools, which should be shaken into the fluid before it is administered." (Lond. Med. and Phys. Journ., May, 1830.)

Hufeland, also, declares that he has often used the dulcamara with decided benefit in chronic cutaneous diseases; and we may also cite the very respectable testimony of Carrere, Althof, and Sprengel, in favor of its usefulness in affections of this kind. Hufeland says that he found the following combination particularly valuable.‡ The eruption is at first, generally, somewhat

* The following is his method of employing this remedy:—Take of stalks of dulcamara one ounce; water one pound and a half; boil to a pound, and strain when cold. Of this decoction, two ounces are to be administered at first, morning, noon, and night, and then gradually increased until the patient takes of it to the amount of a pint a day. At the same time, the skin is to be washed with a stronger decoction. If it produces giddiness, syncope, or palpitation, the dose is to be decreased. The good effects of this treatment are generally not observed until it has been continued for eight or nine days.

† Practical Synopsis of Cutaneous Diseases. By Thomas Bateman, M. D., F. L. S., p. 34.

‡ ℞.—Antim. crud. ʒi;
Extract. dulcamara ʒiv.—M. Divide into three grain pills. S. Take

increased before it begins to disappear under the use of the narcotic. Alibert,* however, regards it as of doubtful efficacy in affections of this kind. From a very considerable experience with this remedy in the hospital St. Louis, he is led to consider it as at most but a useful auxiliary to more vigorous applications. Much of the contradictory experience in medicine depends, perhaps, on the different modes and doses of exhibiting remedies. It appears from the writings of this physician, that the medicine was employed in much smaller doses in his practice than are generally used by the English and American physicians. It is, therefore, not improbable, that Alibert's want of full success with this remedy arose, in part, from his having used it in insufficient doses. It should, I think, always be given in doses sufficient to render its influence upon the system manifest, by the vertigo, palpitation, &c., which it produces.

I have found the extract of dulcamara a very useful remedy for chronic venereal pains and stiffness of the muscles. In the treatment of chronic rheumatism, too, this narcotic has been highly recommended. Kuhn, Althof, Hufeland, and Stark, have published statements illustrative of its good effects in this disease. It is said to be particularly beneficial in cases of rheumatism, arising from the abuse of mercury, or from the effects of cold while the system is under the mercurial influence.

Walsh (on Venereal Affections, &c., 1811) says that in rheumatism and other chronic affections from these causes, he has almost uniformly derived signal advantage from this remedy; and Girtanner declares that in diseases of this kind its powers cannot be too highly estimated. Let it be borne in mind, however, that to derive any decided benefit from this article, it must be given in full doses, and continued regularly until it produces some manifestations of its action, such as vertigo and nausea.

Boerhaave and Werlhop speak highly of the powers of this remedy in phthisis. It need hardly be observed that subsequent experience did not confirm their sentiments on this point. Linnæus recommends it as a most powerful remedy in jaundice and asthma †

From its diuretic properties it has sometimes produced useful results in dropsy. It is stated in the Gazette de Sante, that a Flemish lady "who had the reputation of possessing a specific for dropsy," employed the dried stalks of this plant.

Dr. Thatcher states that "the bark of the root, simmered mode-

six pills three times daily, and gradually increase the dose to fifteen or twenty pills.

* Elémens de Thérapeutique.

† Materia Medica, § 95.

rately for some hours, in fresh butter or cream, forms one of the most efficacious ointments to be applied to excoriated nipples of nursing women."*

Bergius observes, that the narcotic properties of this plant are lost by drying; and that, of course, the fresh plant is much more powerful than when in a dry state.

The best mode of exhibiting this remedy is in the form of decoction or infusion. The following formula, altered from Quarin, is the one which I have commonly prescribed: take of the stalks (or twigs) of dulcamara, one ounce, cut them into small pieces, and bruise; steep them in a proper quantity of hot water for half an hour; boil afterwards for a minute or two over the fire. To a quart of the strained liquor, add of spirit. cinnamon. L. Ph., two ounces. Dose, a cupful three times a day.†

DIGITALIS PURPUREA.—FOXGLOVE.

This is a biennial plant, growing abundantly in the mountainous forests of Switzerland, and cultivated with us, both for the beauty of its flowers and for remedial purposes. When properly dried it possesses a faint, narcotic odor, and a bitter, nauseous taste. It yields its medicinal virtues both to water and alcohol. "It contains extractive matter and a green resin, in both of which its narcotic properties reside."‡ It is also said to contain ammonia and some other salts.

When taken in an excessive dose, it produces heaviness of the joints, indistinctness of vision, nausea, syncope, trembling, vertigo, pain in the forehead and in the bottom of the orbits, drowsiness, slow and tremulous pulse, vomiting, and occasionally diarrhœa, with pain of the bowels, cold sweats, coma, convulsions, and apoplectic death. It has also been known to produce an inability to retain the urine. Small and frequently repeated doses occasion a peculiar distressing nausea, attended with anxiety and depression of spirits; debility, vertigo, false vision, great diminution of the frequency and force of the pulse, reducing it, sometimes slower than forty strokes in a minute; languor both of body and mind. It sometimes renders the pulse irregular and convulsive, without diminishing its fullness. Its narcotic effects are by no means transient; they are, on the contrary, apt to continue long, and even occasionally to reappear after having subsided.§

* The Am. New Dispensatory.
† Thesaurus Medicaminum, p. 113.
‡ Paris's Pharmacologia.
§ Burdach, Arzneimittellehre, B. iii.

In administering this powerful remedy, we ought always to bear in mind, that it will occasionally manifest no operation for many days, and then all at once display its powers, and bring on, very suddenly, the most alarming prostration. Dr. Baildon states a fact in the Edinburgh Medical Journal, July, 1807, which is extremely interesting as well as curious. After having got his own system under the sedative influence of digitalis, he found his pulse not lessened in frequency when he stood erect, beating then at the rate of above a hundred in a minute; when he sat down it beat considerably slower, and when lying on his back it fell as low as forty. He tried this experiment on himself repeatedly, and always found the pulse to vary in the same manner. He states also that he observed the same results in other persons to whom he gave the digitalis. Other practitioners have observed similar variations in the pulse, in persons under the narcotic influence of this medicine.

To Withering belongs the merit of having first regularly investigated the medicinal virtues of this plant. But, as is frequently the case with those who introduce a new remedy to the notice of the profession, he, without doubt, estimated its powers too highly. It is, notwithstanding, very deservedly considered as an important article in the materia medica; and although physicians do not now place much reliance in its powers as a remedy in phthisis, it is still on various accounts entitled to very great attention.

The question whether digitalis be sedative or stimulant in its primary operation, is still a subject of controversy. Dr. Sanders, who has written an excellent work on the foxglove, strongly advocates the latter doctrine, whilst others, with more correctness, contend for the former opinion.* I am entirely persuaded that its operation is immediately sedative; for it is certain that its stimulant effects, if it has any at all, are extremely feeble, and by no means proportionate to its ultimate sedative influence. "The fact of the sedative effects of digitalis," says Dr. Ferriar, "is so decisive, that I do not hesitate to employ this term, notwithstanding the jargon with which the public has of late years been abused on the subject of sedatives."† By means of this remedy we may direct the action of the heart without evacuations, and often reduce its frequency and force more effectually than by any other means in our power.

* "If any person were inclined to write a satire on medical evidence, the different testimonies respecting the properties of this single plant would furnish abundant materials. 'It is a diuretic,' says one physician. 'It has no diuretic power,' says another. 'It is a stimulant,' says a third. 'It is a sedative,' cries another. 'It has no properties at all,' exclaims a fifth."—*Ferriar's Medical Histories.*

† Essay on Digitalis, p. 2.

From its extraordinary effects of diminishing the force and frequency of the heart and arteries it is prescribed in a variety of diseases where this effect is desirable, and where venesection possesses no adequate power over the circulation. It is chiefly on these effects that its reputed advantages in phthisis are considered to depend.

Drake, Fowler, Beddoes, Mossman, Stafford, and others speak in terms of great confidence of the curative powers of digitalis in phthisis. Drake* gives an account of fifteen cases of confirmed consumption treated by this remedy, out of which nine were cured, one relieved, and five died. Mr. Magennis,† physician general at the naval hospital at Plymouth, instituted an extensive course of experiments with this article in consumption. Out of seventy-five, fifty-three were in the purulent stage, and twenty-five in the incipient. Of these forty-four were cured, twenty-two relieved, and but ten died. Dr. Beddoes also expresses, in very strong terms, his good opinion of the digitalis in this disease. "I daily," says he, "see many patients in pulmonary consumption advancing towards recovery with so firm a pace, that I hope consumption will henceforward as regularly be cured by foxglove as ague by the Peruvian bark."‡ In incipient phthisis, Dr. Mossman§ regarded this remedy as almost a specific.

Unreasonable as these hopes may now appear to us, it is certain that considerable advantage may occasionally be derived from the employment of this medicine. When we consider the power which foxglove possesses of lessening irritability and the impetus of the circulation, we can hardly doubt that it is peculiarly adapted to the early stage of this disease. In the commencement of this complaint, when inflammation is going on in the lungs, and before it has terminated in suppuration, digitalis may be of service by subduing the circulation, and thereby resolving the local pulmonic inflammation. Dr. Ferriar‖ was the first who entertained this view of the modus operandi of digitalis in diseases of increased vascular action. Darwin, Fowler,

* London Medical and Physical Journal, vol. ii. p. 268.

† London Medical and Physical Journal, vol. v. p. 204.

‡ Observations on the Causes, Early Signs, and Prevention of Consumption, &c., by Thomas Beddoes, M. D., 1799.

§ Essay on Glandular Consumption, in the Medical and Physical Journal, vol. iv. p. 309.

‖ "It is well known," says this judicious physician, "that bleeding with the lancet is very inadequate to the purpose of lessening (in some cases) the velocity of the circulation, unless it be carried to a dangerous excess. The foxglove furnishes us with the means of regulating the pulse to our wish, and of supporting a given state of velocity, as long as we judge it proper."—*Ferriar on the Medical Properties of the Foxglove*, p. 12.

and Drake referred the beneficial operation of this remedy in pulmonary consumption to its power of diminishing secretion and augmenting pulmonary absorption. We know, however, that the foxglove has a powerful tendency to diminish the activity of the heart and arteries; and as the most effectual mode of reducing inflammation is to lessen the general energy and velocity of the circulation so we may fairly infer that in phthisis, which, in its earlier stages, is always attended with more or less pulmonic inflammation, digitalis, if it act beneficially at all, does so by virtue of its sedative properties. This accords with the experience of Dr. Magennis. "I have met," he observes, "with several instances in which the digitalis given freely and largely effected not the smallest reduction of the pulse; and in these the patients uniformly derived no advantage whatever from its use."*

Measles are often attended with an inflammatory condition of the mucous membranes of the lungs and trachea about the time the eruption is subsiding; producing hoarseness, cough, and dyspnœa, and not unfrequently leading on to pulmonary consumption. To obviate these occurrences, it is frequently necessary to adopt rigid antiphlogistic measures, of which bleeding and blisters are undoubtedly the most effectual. As an auxiliary to these means, digitalis has been employed with undoubted advantage. Dr. William Hamilton, of Suffolk,† says, it is "in the advanced stages of measles, when the disposition of the membranes lining the chest to inflammation shall have ceased, or have been overcome by appropriate remedies, that its use will be found most effectual towards checking the consumptive tendency."

Of its powers in pneumonia not much can be said. This is a disease too rapid in its course to allow of such tardy modes of reducing the activity of the circulation. We are enabled by the lancet to effect this purpose in a much more prompt and effectual manner. The employment of this article, though, perhaps, never to be depended on in this case, as a principal remedy, may notwithstanding become a useful auxiliary after more prompt antiphlogistic measures have been employed, or where much general debility exists, attended with irritation of the lungs, difficult breathing, troublesome cough, quick and corded pulse, and a dry skin.

This article is well spoken of by Drs. Currie and Ferriar,‡ as a valuable remedy in active hemorrhages. Richter also recommends it as particularly useful in hemorrhages from the lungs

* Lond. Med. and Phys. Journal, vol. v. p. 204.

† Observations on the Digitalis Purpurea, by Wm. Hamilton, M. D., p. 154.

‡ Medical Histories and Reflections, p. 104 and 258.

and nose.* As a general practice, however, I agree with Dr. Chapman,† that wherever hemorrhage depends on an active state of the circulation, and where this requires reduction, bleeding is at once the most direct, safe, and efficacious remedy. In hemoptysis, however, where there is an irritable state of the heart and arteries, indicated by a small, quick, corded, and spasmodic pulse, digitalis, may afford important advantages when venesection is of no avail. It is particularly recommended under such circumstances by Frank, Richter, and Ferriar.‡

In cases of threatened abortion, attended with hemorrhage, Mr. Burns recommends the exhibition of digitalis combined with opium. By this remedy, if given in strong doses, we diminish at once the contractile efforts of the womb, and the force of the circulation, and thereby lessen the chance of miscarriage and the hemorrhage.

Digitalis has also been successfully applied to the cure of epilepsy. Burdach says it is particularly serviceable in this affection when attended with a strumous diathesis in children.

In the cure of spasmodic asthma, Dr. Ferriar states that he has found digitalis in conjunction with opium "remarkably useful. By keeping the patient constantly under the influence of the medicines, (a grain of each being given every four or five hours,) I have ever seen a permanent suspension of the symptoms of this disease. When the stomach will bear the digitalis without difficulty, I believe that very great and almost immediate relief may thus be obtained."§ My own experience enables me to speak favorably of this practice. In two instances of this disease I derived very decided advantage from such a combination of opium and digitalis.

The foxglove has acquired some character as a remedy in mania. From its sedative effects it would not be unreasonable to expect useful results from its employment in cases of mania, where, after frequent purging and bleeding, the arterial and nervous systems remain in a state of increased excitement. Mr. G. Hill has used this remedy with considerable success in mania, and Dr. J. M. Cox‖ observes, that no case ought to be given up as hopeless in which this remedy has not been tried, and its employment persisted in, till some obvious effects have been produced. He considers it most efficacious in those cases of mania where the circulation is increased without other febrile symptoms. "I had a patient," says he, "whose system was kept saturated,

* Specielle Therapie, vol. iii. p. 296.

† Elements of Therapeutics, p. 265, first edition.

‡ Observations, &c., p. 99.

§ Ferriar's Essay on Digitalis.

‖ Practical Observations on Insanity, &c., p. 85.

as it were, with digitalis for weeks in succession, whose mental wanderings seemed regulated by the state of the circulation; when the pulse was at ninety, he was constantly furious; at seventy, perfectly rational; at fifty, melancholic; and at forty, half dead. He was, at length, perfectly cured by such a dose of this remedy as kept the pulse pretty uniformly at about seventy, and yet he had sometimes taken three drachms of excellent tincture of digitalis, three or four days following." Dr. Currie, also, in his observations on the digitalis purpurea, published in the fourth volume of the Memoirs of the Medical Society of London, states that he has sometimes derived very great advantages from its employment in this disease.

According to the experience of Richter, digitalis is a remedy of much value in chronic pemphigus. He cured an inveterate case of this kind, by the use of this article in combination with calomel and opium. He gave two grains of powdered digitalis with one grain of calomel and half a grain of opium, three times daily, with entire success. (Speciel. Therapie, vol. ii. p. 615.) Henning employed digitalis with marked benefit in herpetic eruptions. It has also been much extolled as an external application, in the form of a strong infusion, in chronic cutaneous affections. Weaver (Lond. Med. Repos.) used it in this way in a case of inveterate itch, with complete success.

Some of the old English writers on the materia medica, speak highly of digitalis as an external application to scrofulous ulcers. In the Annals of Medicine, a periodical work, the beneficial effects of this article, as a local application in ulcers of this kind, are strongly set forth by Mr. Couch, of Polperro, in Cornwall. A strong decoction of the leaves was employed by this gentleman. It has also been employed internally in scrofulous affections with manifest advantage. Hufeland (Treatise on Scrofula, p. 249), prescribed it with decided benefit in the early stage of active scrofula, and in the scrofulous diathesis. Administered in conjunction with burnt sponge, Rust found it very beneficial in struma. Kotrum administered the extract of digitalis in union with the extract of cicuta, the golden sulphur of antimony and calomel, in scrofulous affections; and he asserts that he has often obtained important advantage from this combination.* Uwins obtained very favorable effects from digitalis in *tabes mesenterica.* (Lond. Med. and Phys. Journ., 1818.)

* ℞.—Extract. digitalis ʒss;
Extract. cicutæ ʒi;
Antim. præcipit. auri. ϑi;
Submuriat. hydrarg. gr. x.—M. Of this mixture, ten grains are to be taken mornings and evenings.

Like almost all other vegetables of great powers, this plant is found to be of very different strength, as it is met with in the shops. "It is, therefore, very important," says Dr. Paris,* "that the leaves of this plant be properly collected and accurately preserved; they should be gathered when the plant is beginning to flower; the largest and deepest colored flowers should be also selected, for they are the most powerful; they should be also carefully dried until they become crisp, or they will lose much of their virtue. The powdered leaves ought to be preserved in opaque bottles, and kept from the action of light, as well as of air and moisture; a damp atmosphere has a very injurious operation, by carrying off those faint poisonous effluvia with which its efficacy seems to be intimately connected."

It may be exhibited in substance, tincture, or infusion. The powdered leaves are to be given in the dose of gr. i two or three times a day, and gradually increased until its effects become apparent. If it be given with a view to obtain its diuretic effects, it will sometimes be necessary to combine it with opium, in order to prevent it from occasioning a vomiting or purging, which lessens or destroys its diuretic powers. The effects of an over-dose are most effectually counteracted by opium or brandy, and epispastics to the stomach. The tincture is very commonly employed. The dose of it is twenty drops, which is to be cautiously increased. The cataplasma digitalis is made thus: fol. digit. sicc. ℥iii (or fol. digit. recent. ℥iv); aquæ ℔ii, coque ad dimidum; strain, and with the decoction and linseed meal make a poultice.

When it is necessary to exhibit this remedy repeatedly during the day, its effects ought to be watched with the strictest attention, to prevent the alarming and even fatal consequences which may arise from administering this powerful medicine incautiously.

For the character and remedial employment of digitalis as a diuretic, see the chapter on this article under the head of Diuretics.

Formulæ.

℞.—Tinct. digitalis ℥ss;
—— tolutan ℥i;
—— opii ʒi.—M. Take forty drops three times daily; in chronic cough.

℞.—Pulv. digitalis gr. vi;
—— nitrat potass. ʒiss;
Submuriat. hydr. gr. iv.—M. Divide into ten equal parts. Dose, one every two hours; as an antiphlogistic in inflammatory affections.

℞.—Pulv. scillæ exsiccat. gr. iv;
—— digitalis gr. x;

* Pharmacologia.

Submuriat. hydrarg. gr. vi;
G. myrrh ℈i;
Simul tere, et adde
G. assafœtid. ʒss;
Extract. gentian. q. s.—M. In pil. dividend. No. xv. Take one three times daily.

NICOTIANA TABACUM.

Tobacco is endued with very active poisonous properties, and may be applied to important remedial purposes. It possesses a narcotic fetid odor, and a somewhat bitter and extremely acrid taste. By chemical analysis it is found to contain "mucilage, albumen, or gluten, extractive matter, a bitter principle, an essential oil, nitrate of potass, and a peculiar principle upon which the properties of the plant are supposed to depend, and which has been named *nicotin.*" Vauquelin considers this substance as approaching the volatile oils in its properties; it is colorless, of an acrid taste, and has the peculiar smell of tobacco; it occasions violent sneezing; "with alcohol and water it produces colorless solutions, from which it is thrown down by tincture of galls."* The active matter of tobacco is readily extracted both by water and by spirit, but more perfectly by the latter. By distillation the leaves afford an oil which possesses the peculiar powers of the plant in a highly concentrated state.

When tobacco is received into the stomach in a large dose, or is applied to any other part of the system susceptible of its influence, it produces nausea, great distress of feeling, cold sweats, vomiting, trembling, vertigo, spasm, insensibility, &c. When taken in an enormous dose it destroys life very speedily. Brodie,† from a number of experiments which he performed on animals with this plant, was led to conclude that it destroys life by rendering the heart insensible to the stimulus of the blood, and thus stopping the circulation. Orfila asserts‡ that the action of tobacco is more energetic when injected into the anus than when received into the stomach.

It seems to be almost equally active when applied to the external surface in parts where the skin is broken. Orfila mentions, upon the authority of Vandumond, instances where the decoction of the leaves applied to parts affected with itch, excited violent vomitings and convulsions.§ I saw a child a few years ago

* Paris's Pharmacologia, p. 534.
† Philosophical Magazine for August, 1811.
‡ System of Toxicology, article Tobacco.
§ Recueil Periodique, tom. vii. p. 67.

thrown into alarming convulsions and syncope, by the imprudent application of tobacco ointment to an obstinate pustular eruption on the top of its head.

As a remedial article, tobacco may be very usefully employed in many instances. Stahl recommended an extract of it, made by long boiling, as a very effectual and safe expectorant and diuretic remedy. Paris states that long coction weakens the powers of this plant; the extract recommended by Stahl may, therefore, be a safer and more effectual remedy in consequence of having its poisonous parts dissipated by the long-continued boiling, whilst its aperient, expectorant, and diuretic properties may not suffer any material diminution by such a process.

Tobacco has been successfully employed in the cure of dropsy and dysury. Dr. Fowler* has written a work expressly on its virtues in these diseases: and he speaks of it as a remedy which, if properly administered, is capable of producing copious diuresis. He used it in the form of infusion, of which he gave about eighty drops. He observes that the best time for administering it is two hours before dinner, and on going to bed. He asserts that he found it equally effectual in nephritis calculosa. Mr. Earl, surgeon of the Foundling Hospital, London, has published an interesting paper on the efficacy of tobacco injections in retention of urine.† The cases to which he considers it as particularly applicable are those which depend on a spasmodic state of the urethra, and which sometimes supervene in consequence of accidental causes, "in persons who have been long subject to strictures in the urethra, but who are still able to void their urine in a small stream." In instances of this kind it is often impracticable to introduce instruments into the bladder, and it becomes necessary to overcome the retention by other means. Under such circumstances, therefore, Mr. Earl has employed tobacco injections with great success in three cases, after all the usual means had been resorted to ineffectually. Dr. Westburg, also, states that he has frequently administered the tincture of tobacco in ischuria with signal success. He directs twenty drops to be taken every hour, in a glassful of flaxseed tea. (Revue Méd., Nov. 1823.)

With a similar intention of removing constriction, tobacco is employed in cases of incarcerated hernia, and frequently with complete success. For this purpose either an infusion or the smoke of the plant is injected into the rectum. The very great relaxation which is thereby produced throughout the whole body, generally enables the surgeon to reduce the protruded parts very readily.

The same practice will often produce almost immediate relief

* Medical Reports of the Effects of Tobacco in the cure of Dropsies and Dysenteries, by Thomas Fowler, M. D. Lond. 1785.

† Medico-Chirurgical Transactions, vol. vi.

in cases of obstinate constipation, depending on a spasmodic constriction of the bowels. In employing tobacco injections it is, however, of the utmost importance to proceed with very great caution. If the quantity injected be too great, it will produce the most alarming symptoms, such as vomiting, cold sweats, universal prostration, syncope, and even death. I have known an empiric destroy, in less than twenty minutes, the life of a charming little boy—the son of a gentleman at Lancaster, whose family I attended while residing in that place—by an immoderate injection of the infusion of tobacco. In general half a drachm of the leaves infused in eight or ten ounces of water, will be as much as can with safety be thrown into the rectum at one time.

Tobacco has also been recommended as an excellent remedy in dysentery. Dr. O'Brien employed it in the form of enemata, in the proportions of ten grains of the tobacco to six ounces of boiling water, at the same time that the abdomen was 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, to allay the intestinal spasm, tormina and tenesmus, and to restore the free action of the cutaneous exhalants."

Tetanus, too, is one of the diseases in which tobacco has been employed with decided advantage. Dr. James Norcom relates a case which was cured by tobacco injections. (Philadelphia Journ. Med and Phys. Science.) Dr. Anderson has reported three cases of traumatic tetanus which yielded to this remedy. He employed it by fomentations, baths, and enemata. We have also the testimony of O'Beirne, Gardener and Lefoulon in favor of the usefulness of this remedy in tetanus.

A cataplasm composed principally of this plant, applied to the pit of the stomach, was employed with success, both in epilepsy and obstinate intermittents, by Dr. James Currie of Liverpool. The application was made about half an hour before the accession of the paroxysms of these diseases.

As an external application either in the form of an ointment or infusion, it has been a good deal recommended in porrigo, and other cutaneous diseases. I have used it in two instances in this affection, to a very great extent, without, however, deriving any permanent advantage from it. The late Professor Barton was in the habit of applying a poultice of tobacco leaves pounded in vinegar to the region of the stomach, in cases of worms. "In consequence of this application," he observes, "worms are often discharged after powerful anthelmintics have been exhibited internally in vain."* I have, in several instances, resorted to this

* Collections for an Essay towards a Materia Medica of the United States, p. 63.

practice in cases of worms, without the slightest benefit, although the existence of worms in the bowels was rendered certain by the frequent spontaneous discharge of them.

STRYCHNOS NUX VOMICA.

The tree which affords this article is indigenous to the eastern continent. It is particularly abundant along the coast of Coromandel, Malabar, and at Ceylon. Its fruit, which is a berry of the size of a small orange, contains in its pulp the seed which is the officinal nux vomica. These seeds have been analyzed by Pelletier and Caventou, who obtained from them a yellow coloring matter, a concrete oil, gum, starch, bassorin, a small quantity of wax, and two peculiar alkaline principles, *brucia* and *strychnia*, united with a peculiar acid, which they named *igasuric acid*. *Strychnia*, which contains the active properties of the nux vomica, in a highly concentrated state, crystalizes in small four-sided prisms, terminated by quadrilateral pyramids. It is inodorous, but has an intensely bitter taste, leaving a slight metallic flavor on the tongue. "So exceedingly bitter is this substance, that one part of it communicates a sensible taste of bitterness to 600,000 parts of water." It is very sparingly soluble in water, requiring 6667 times its own weight of water, at fifty degrees of temperature, for solution. Alcohol and the volatile oil dissolve it very readily. It forms neutral salts with the acids, which become "blood-red by the action of concentrated nitric acids." The deleterious effects of the nux vomica on cats, dogs, foxes, and certain birds, were long since observed by Gessner, Wepfer, Bunner, and others. By the more recent experiments of Desportes, Magendie, and Delisle, the peculiar powers of this substance have been more particularly elucidated.

When given to dogs as a poison, it produces great anxiety, laborious and confined breathing, retching, and nausea, tremors, violent convulsions, tetanic spasms of extraordinary force, asphyxia from immobility of the thorax, and death. In animals thus killed, Delisle, Magendie and Desportes never found the least trace of inflammation. It appears to extinguish life by destroying the power of the respiratory muscles, and thus producing asphyxia. According to the experiments of Delisle, no effects whatever are produced when this substance is applied directly to an exposed nerve. When, however, thrown into the cavity of a serous membrane, it speedily proves fatal. Murray appears, therefore, to be wrong in attributing the deleterious effects of the nux vomica to its immediate operation on the nervous system.*

* Alibert, Elémens des Thérapeutiques, &c., t. i. p. 435.

Its effects upon the human system are similar to those which it produces in animals. Magendie and Delisle observed that it has the power, when taken in a proper dose, of exciting strong spasmodic contractions of the voluntary muscles, without materially affecting the more important vital organs of the system. M. Fouquier, physician of the Hôpital de la Charité, taking advantage of this singular property conceived in the idea of applying it to the cure of paralysis. He accordingly administered it to a number of patients affected with paraplegia and hemiplegia, and obtained from it very important results. The effects of a sufficient dose were, invariably, strong muscular contractions, of more or less permanency; consisting sometimes of sudden and transient starts; and at other times of clonic contractions of a tetanic character. These contractions are, in general, stronger in the paralytic parts than in those which are healthy. M. Fouquier observes, that a very strong dose has sometimes produced general tetanic convulsions, without, however, doing any mischief. Dr. Lescure* relates several cases of paralysis in which the nux vomica proved successful. He gave four grains of the extract, divided into two doses, daily, to a patient who had been for four years affected with paraplegia. The dose was gradually increased to six grains in the second week; the patient then began to feel heat in the stomach, a sense of constriction in the abdomen, difficulty of voiding urine, and now and then slight contractions of the muscles of the lower extremities. The remedy was now omitted for a short time. On being resumed and continued for some days, forcible and sudden contractions seized the paralyzed limbs, and the retention of urine was more complete than on the former occasion. On again omitting the medicine, these symptoms disappeared. It was then resumed in the dose of eight grains, and at the termination of three weeks, he again was taken with tetanic contractions, which continued four hours. The patient now gradually recovered the use of his limbs.

The nux vomica has also been employed in intermittents, mania, epilepsy, gout, rheumatism, cutaneous eruptions, hydrophobia, scrofula, and hypochondriasis. Hagstrom, a Swedish physician, asserts that he found it of great service in an epidemic dysentery. It was given in the dose of twenty grains of the powdered nut once a day in some barley-water, after the bowels had been duly evacuated by laxatives. It is also particularly commended by Hufeland, for its good effects in an epidemic dysentery that occurred at Jena in 1795. A late German writer of great respectability, states that he used it in an epidemic dysentery that prevailed at Melle, a town in the principality of

* Journal Universel des Sciences Médicales, tom. xi.

Osnaburg, in 1800. He gave it in doses of two and a half grains every two hours. "It sometimes allayed the pain, though in a few individuals it increased it."* It does not appear, upon the whole, that its efficacy in this disease is such as to entitle it to any particular attention.

Strychnia has recently been employed with great advantage in certain diseases of the eye. Mr. Middlemore found it "of singular service" in a case of ptosis, dependent on partial paralysis of the levator muscle. He has also used this remedy with decided benefit in amaurosis. In cases arising from "overworking the eye," by confining it to the inspection of objects of the same color, "or by looking many hours daily at bright substances of the same, or nearly the same color, or subjecting it to sudden transitions from an artificial glare to a comparative darkness;" in cases, in short, depending on mere functional torpor of the retina, unattended by structural change or congestion of the vessels of the eye, the use of this narcotic will often procure decided benefit. The mode of using the *strychnia* in cases of this kind, is to blister the skin above the eyebrow, and after the cuticle is carefully removed, to sprinkle the powder on the raw surface. One-twelfth of a grain of the strychnia on each side, will be sufficient to begin with. It always causes very severe smarting pain of the part upon which it is applied. "Some patients cannot bear its application; others require great care, and a very gradual augmentation of the quantity to enable them to bear it; whilst others will admit of its application without experiencing any other inconvenience than what arises from its action upon the sore." Dr. Short (Edin. Med. and Surg. Journ., Oct. 1830) states, that in eight out of nine cases of amaurosis, decided benefit was derived from the application of strychnia. It may be applied once daily. Dr. S. observes that the good effects of this article are generally enhanced by the previous use of mercury.

In paralysis, strychnia has been found highly beneficial. Dr. Geddings, of Baltimore, has given an account of some cases of this affection, in which the good effects of this remedy "were strikingly manifested."†

The nux vomica may be given either in substance or in the form of an extract. Four grains of the powdered nut, or two of the extract, may be given three, four, or five times a day, and continued until its operation on the system is adequately manifested. It will, in general, be necessary to increase the dose gradually, in order to obtain its peculiar effects. The alcoholic extract alone is employed.

* Summa Observationum Medicarum, &c., by L. I. Schmidtman, M. D. Beraline, 1819.

† Amer. Journ. Med. Sciences, vol. vii. p. 334.

In cases of poisoning from nux vomica, Orfila recommends two spoonfuls of the following mixture every ten minutes, after the contents of the stomach have been evacuated.—℞. Æther vitriol. ʒi; ol. tereb. ʒii; sacch. albi ℥ss; aquæ puræ ℥ii. The best mode of administering strychnia internally, is to dissolve two grains of it in an ounce and a half of distilled vinegar. Of this solution, twenty drops may be given twice, or even three times daily, in a small portion of the infusion of orange peel.

Formulæ.

℞.—Extract. nucis vomic. gr. x;
Mucilag. g. Arab. ℥i;
Aq. fontanæ ℥vi;
Syrup. zingiberis ℥i.—M. Dose, two tablespoonfuls every two hours, in dysentery.—(*Hufeland.*)

℞.—Extract. nucis vomicæ gr. x;
Pulv. ipecac. gr. xv.—M. Divide into fifteen pills. Take one pill every four hours, until its effects on the system are decidedly obtained, in dysentery or paralysis.

RHUS TOXICODENDRON, VEL RADICANS.—POISON OAK—SWAMP SUMACH.

This is a very common shrub in this country, and well known by its property of inflaming the skin to a very alarming extent, simply on coming in contact with its leaves, or even by a close approach to it, in persons who are peculiarly sensible to its influence. Mr. Van Mons of Bruxelles, has published a chemical examination of this species of rhus. He asserts that the poisonous exhalation of this shrub is a carbonated hydrogen gas. It contains, also, a considerable quantity of tannin, some gallic acid, a small portion of green fecula, and a still smaller quantity of gum and resin.

It does not appear that it possesses any very deleterious properties when taken internally. Orfila observes that it blunts the activity of the nervous system after being absorbed. Alibert,* however, states that a M. Boullon inoculated himself in his presence, with the juice of the rhus toxicodendron, with perfect impunity. On the skin, however, its poisonous properties act with great energy. When touched or handled, it produces in the course of two or three days, very serious symptoms. The skin inflames and swells, being attended with a very distressing burning pain. If the face be affected, the eyelids are so tumefied as to close up the eyes; the whole head is swelled and covered with

* Elémens des Thérapeutiques, tom. i. p. 452.

little blisters containing serum. Sometimes the whole body is enormously swelled, and covered with serous vesicles. When the inflammation and swelling have in some degree subsided, the epidermis begins to separate in little squamæ, and an intolerable itching is felt for some days longer. The arterial system, during an affection of this kind, is very considerably excited.*

These symptoms bear a very strong resemblance to those of erysipelas; and it is observed by Mr. Van Mons, that they yield to the remedies commonly employed for the cure of this latter affection. M. Gouan recommends aqua ammonia, diluted in water, as a useful application; but I believe nothing has yet been discovered more effectual in such cases, than the application recommended by the late Professor Barton, namely, an aqueous solution of corrosive sublimate.

The rhus toxicodendron has been a good deal praised for its remedial powers in the treatment of paralysis, herpes, and consumption. M. Dufresnoy, professor of botany at Valencia, speaks in very high terms of its efficacy in these affections. The experience of Verdeyen, Koch, Van Baerlem, Rumpel, Burdach, and others, is also in favor of its employment in these and other affections. M. Pou, professor at Montpellier, cured a paralytic patient in a very short time with the extract of this plant. M. Gouan was equally successful in curing a young lady affected with hemiplegia. Dr. Alderson relates seventeen cases of paralysis, in all of which this remedy was usefully employed.† In two cases of hemiplegia, the employment of this article was attended with very good effects in my own practice; and Dr. Ossann has informed me, that, in the Polyclinic Institute of Berlin, it has been used in conjunction with G. guaiacum, in paralysis, with unequivocal advantage. In very large doses, it is apt to produce active purging. The dose of the extract is at first about grs. xx, to be gradually increased until some effects on the system are produced. The powdered leaves are given in the dose of from one grain to ten, three or four times a day.

Formulæ.

TINCTURE.

℞.—Fol. rhois toxicodend. ℥i;
Spir. vini rectificat. ℥xii;
Aq. fontanæ ℥iv.—M. Digest for six days. Dose, from thirty to sixty drops, three times daily.

℞.—Tinct. rhois toxicodend. ℥ss;
Tinct. aconit.,
Tinct. guaiaci volat., āā ʒii.—M. Take forty drops every three hours.

* Alibert, Elémens des Thérapeutiques, tom. i. p. 454.

† An Essay on the Rhus Toxicodendron, &c., by J. Alderson, M. D.

TELA ARANEARUM.

THE spider's web has been long known as a domestic remedy for the cure of agues; and we find it mentioned in the dispensatory of Schroder, published in 1644, as possessing such remedial powers. It is to Dr. Robert Jackson, however, that we are indebted for a more particular and satisfactory account of its powers, and consequently for the attention which it has lately received from the profession. This respectable physician, in a communication published in the Medical and Physical Journal,* states that Dr. Gillespie, of Edinburgh, had succeeded in curing a very obstinate case of ague by the spider's web, after various other means had been tried ineffectually. He then details his own experience with this substance in the treatment of intermittents, the result of which goes directly and strongly in favor of its remedial powers. "I think," says he, "I may venture to say that it prevents the recurrence of febrile paroxysms more abruptly and more effectually than bark or arsenic, or any other remedy employed for that purpose with which I am acquainted; that, like all other remedies of the kind, it is only effectual as applied under a certain condition of habit; but that the condition of susceptibility for cobweb is at the same time of greater latitude than for any other of the known remedies. The cobweb was rarely given before the subject was prepared by bleeding, emetics, or purgatives."

The more obvious effects of this remedy, when taken into the system, are to allay irritation, to tranquilize the mind, and to induce easy slumbers. Dr. Jackson declares that the cobweb allays "morbid irritability, and calms irritation both of body and mind, in a degree far exceeding any drug or remedy within the circle of our knowledge." He further observes that the effects which it produces characterize it as powerfully stimulant. When the pulse is quick, frequent, irregular and irritated, it becomes slow, calm and regular by its operation. In general the surface becomes relaxed and covered with perspiration. If the pulse is slow, regular and nearly natural, it generally becomes frequent, small, irregular, and sometimes intermitting. Where languor and depression exist, "sensations of warmth and comfort are diffused about the stomach, and increased animation is conspicuous in the appearance of the eye and countenance." I have taken it very often, and have uniformly found it to produce a calm and delightful state of feeling, succeeded by a disposition to sleep. This accords with the experience of Dr. Oliver, of Salem, who found

* Vol. xxi.

it to produce in himself "the most delicious tranquillity, resembling the operation of opium, and followed by no bad effects."

In consequence of these soothing properties, the cobweb has been found an excellent palliative in the advanced stage of consumption.

Dr. Jackson details a remarkable case of asthma, in which the tranquilizing effects of this substance were conspicuously evinced. The complaint was hereditary, and connected with malformation of the chest. The patient was unable to lie down in bed from a sense of suffocation, and was obliged to take the little sleep he could get in a half-sitting posture, being supported by pillows. In this distressing condition he one night took twenty grains of the spider's web, and obtained from it a sound and uninterrupted sleep all night, "a blessing to which he had been an entire stranger above six years." The same writer states that he has found it very useful in the spasmodic complaints of females, which resist the powers of ordinary remedies. In chronic hysteria, I have employed it with much advantage. I have found it particularly serviceable in women of a relaxed habit of body, accompanied with morbid irritability of the nervous system. In a case which I have at present under my care, my patient derives evident advantage from this article, in combination with the cyanite of zinc, lately introduced into practice by Dr. Hufeland, of Berlin. Dr. Webster,* of Boston, adds his testimony in favor of the remedial virtues of this substance. He has found it to produce very good effects in rheumatic headache, asthma, and chronic coughs. He has also derived much advantage from it in allaying the irritation which sometimes attends a mercurial course. He mentions the following remarkable effects of this remedy in an old and infirm asthmatic: "Slight but pleasant delirium was produced, and from the report of the persons who slept in the room with him, the effect, though of longer duration, was very similar to that of a dose of nitrous oxide gas; the muscular energy having been exceedingly increased, the patient could not be confined to bed, but danced and jumped about the room nearly all night; in the morning I found him quietly asleep. No unpleasant symptoms ensued." The same writer observes, that the cobweb is an excellent application to irritable sores.

It is generally given in the dose of five or six grains, repeated every third, fourth or fifth hour. According to the experience of Dr. Jackson, a dose of five grains produces nearly the same effects as one of twenty.

* New England Medical and Physical Journal, new series, vol. iv. p. 218.

HYDROCYANIC ACID.—PRUSSIC ACID.

The prussic acid is the most prompt and fatal poison known. When perfectly pure, and brought into contact with a wound, or simply applied to the eye or tongue of an animal, it destroys life almost instantaneously. When diluted, however, to a proper degree, it appears, from some late account of its employment in diseases, to be capable of very important remedial applications.

The prussic acid, as it is usually prepared for medicinal purposes, is transparent, without color, of a bland and sweetish taste at first, becoming acrid and hot afterwards. Its specific gravity, at seven degrees of Reaumur, is 0.70583. It reddens the tincture of turnsole slightly. It boils at the temperature of 26° 5′, under a pressure of 0.76^{m}; and at 15° it congeals.* It is so extremely volatile, that when a portion is dropped upon a piece of paper, the part which almost instantaneously evaporates, produces a sufficient degree of cold to crystalize the portion of the acid remaining on the paper. Its odor is strong and characteristic, resembling that of peach-blossoms and bitter almonds. When exposed to light it is soon decomposed, resolving itself into carbonic acid, ammonia, and carburetted hydrogen gas. It is, therefore, necessary to keep it excluded from light, otherwise it will very soon become inert and useless. It is found in a variety of vegetable substances;—in bitter almonds; the kernels of black cherries; in the flowers and leaves of the peach-tree, and particularly in the kernels of the peach, and in the leaves of the prunus lauro-cerasus. For medicinal purposes it is usually obtained from this latter plant, or from the prussiate of iron.

This acid was discovered by Scheele, in 1780. It was soon afterwards ascertained to be highly poisonous, by Schrader, who found that a few drops, or even its vapor, very speedily killed some birds which he subjected to its influence. Its deleterious properties were afterwards more fully ascertained by the experiments of Ittner, Emmert, Coulon, Robert, Orfila, and more recently by those of Magendie. Ittner poured twelve drops of the acid into the mouth of a middling-sized dog. The animal immediately staggered and fell. His respiration was quickened, and his feces passed involuntarily. He was seized with violent opisthotonos, and died in about an hour after the acid had been given him. The effects, however, of the highly concentrated acid are still more violent; and, indeed, truly frightful. Magendie statest† that, on plunging into the throat of a dog the extremity of a glass

* Thénard, Traité de Chimie, tom. iii. p. 462.

† Journal of Science and the Arts, for 1818, No. vii.

tube, that had been previously dipped into a phial containing some pure prussic acid, the animal instantly made two or three long and rapid inspirations, and fell dead. Not the smallest trace of sensibility in the muscular organs could be detected after death. In another experiment he applied an *atom* of the acid to the eye of a dog, "and the effects were as sudden and as fatal as the preceding experiment." "In short," says Magendie, "the prussic acid, prepared according to M. Gay Lussac, is, without doubt, of all the known poisons, the most active and the most promptly mortal. Its deleterious and powerful influence permits us to believe what the historians have related of the criminal talent of Laucustus; and renders the accounts of those extraordinary and sudden cases of poisoning, so frequent in the annals of Italy, less marvelous and incredible."

The action of this acid appears to be immediately directed upon the nervous system. The excitation, however, which it produces in the system, is extremely transient, inducing almost immediate debility and torpor. When the dose is very large, its action is so rapid and intensely energetic, as to cause, like lightning, an almost instantaneous extinction of the vital properties. As a consequence of its power to lessen irritability and sensibility, it diminishes the action of the heart and arteries, though in general this effect is not conspicuously manifested, unless the dose be excessive. Dr. Thomson, in a letter to Dr. Granville, observes that he has never seen its sedative effects preceded by an increase of the action of the heart and arteries, "a circumstance which distinguishes it from all other substances belonging to the class of narcotics." It does not appear to be capable of producing any inflammation in parts to which it is applied. Bitter almonds, however, whose active principle consists of this acid, inflame the stomach when swallowed.

It is only of late that this acid has been extensively employed for remedial purposes; and if the accounts we have had of its good effects be not greatly exaggerated—a suspicion which can hardly be admitted, as they proceed from sources so respectable and various, it is undoubtedly entitled to very great attention.

Bitter almonds and lauro-cerasus, both of which owe their active properties to the prussic acid they contain, were formerly employed as remedies in the cure of intermittents. Hufeland states that he has known two or three bitter almonds, swallowed a short time before the paroxysm, sufficient to prevent its accession.* Bergius,† also, says that cases of ague have been cured by the bitter almond, after having used the cinchona and other reme-

* Bibliothèque Méd., tom. viii. s. 386.

† Bergius, Mat. Med., p. 400.

dies ineffectually. MM. Duvignon and Parent,* of Paris, state that, during the first invasion of the allied army, in 1814, a young English physician, attached to the Russian imperial guards, effectually treated tertian intermittents with Scheele's prussic acid, combined with other substances, in strong doses.

Substances containing the prussic acid, as well as the acid itself, have also been employed successfully in the cure of some nervous disorders. The aqua lauro-cerasus, which is but a very diluted form of the prussic acid, has been much recommended by Hufeland,† Thomasen, Thaussen, Baillie, Wurzer, and others, in mental disorders. Dr. Oliver, of Salem, states that in two instances of mania in females, the prussic acid has been of essential advantage.‡ It has been particularly extolled for its good effects in hypochondriasis depending on disorders of the abdominal viscera, or on onanism. It has also been thought particularly adapted to the cure of mania arising from suppressed exertions.§

Dr. Shallern asserts that he derived very considerable advantage from the employment of laurel water in combination with belladonna, in cases of hydrophobia. M. Dupuytren, however, employed the prussic acid in two instances of this hopeless malady, without the least benefit.

A very large mass of testimony has of late been published, which goes directly and strongly in favor of its powers in the treatment of chronic nervous coughs, and phthisis pulmonalis. Magendie was, I believe, the first who employed the prussic acid in diseases of this kind.‖ Observing its remarkable property of diminishing general sensibility, without materially affecting the respiration and circulation, he was led to the opinion that it might be advantageously employed in cases depending, as these affections appear to do, on a morbid increase of sensibility. He accordingly prescribed it to a young lady who had been affected with a distressing, dry, short cough for above eighteen months. He ordered her "six drops of Scheele's prussic acid, diluted with three ounces of a vegetable infusion, to be taken by spoonfuls every two hours," and in four days her cough disappeared entirely. He states that he afterwards employed the prussic acid

* Medical Recorder, vol. ii. p. 510.

† Journal der Practisch. Arzneyk., B. ix. s. iii.

‡ Thatcher's New Amer. Dispen. (1821), p. 433.

§ Duvignon and Parent, in the Med. Recorder, vol. ii. p. 545.

‖ Since writing the above I have seen an article in the New England Medical Journal, communicated by B. Lynde Oliver, M. D., of Salem, in which he states that he administered both the distilled water and saturated tincture of lauro-cerasus, in phthisis pulmonalis, as early as 1810, and generally with much advantage.

in numerous instances of nervous and chronic cough, and always with the greatest success. Having found it thus efficacious in the treatment of dry and convulsive cough, he resolved on trying it in consumptive cases. The result of his experience, as given in his first report, is that out of fifteen persons affected with pulmonary consumption, he invariably found the prussic acid, administered in small and repeated doses, "to diminish the frequency of the cough, moderate and render more easy the expectoration, and lastly to procure the patients some sleep at night, without any colliquative sweats." In 1820, Dr. Magendie published a small work "On the Use of Prussic Acid in the Treatment of Diseases of the Breast, and particularly in Phthisis Pulmonalis," in which much interesting evidence is offered, in addition to what he had already given, concerning the efficacy of this substance in consumption and other pulmonary affections.

Dr. Granville, too, in a late work on the medicinal uses of the prussic acid, adds his testimony in favor of its powers in pulmonary and other diseases.* He relates seventy-nine cases of different diseases, all of which were cured or relieved by this potent article. A considerable number of these were phthisis in the early stages of the complaint, and a few of them were already far advanced. We have also some observations from Dr. Scudamore, which strongly indicate the good effects of this remedy. This respectable physician prescribed the acid in the dose of ten drops a day to two young patients laboring under all the usual symptoms of confirmed phthisis. They both had a fatiguing cough, frequent pulse, were much emaciated, debilitated, and harassed with night-sweats and copious purulent expectoration; they also had that peculiar form of the nails which usually accompanies these symptoms. These two patients were perfectly cured by the employment of the acid.

In the practice of Professor Macneven, of New York, this remedy has been known to produce excellent effects in incipient phthisis. "I have used the prussic acid," says he, "with great advantage. It almost always removes cough, which accelerates and favors tubercular inflammation in predisposed habits, and thus in many cases prevents the disease."†

I have employed it in five cases of phthisis. In two of these the cough, night-sweats, and hectic symptoms were considerably relieved. In two I observed no obvious advantages from its use, and in one case it did manifest harm, by the excessive prostration which it produced.

* Further Observations on the Internal Use of Prussic Acid. London, 1820.

† American Medical Recorder, vol. iii. p. 574.

In the cure of hooping-cough this new remedy appears, from ample testimony, to be very efficacious. Hahnemann recommends the aqua lauro-cerasus as exceedingly useful in this distressing affection. Dr. Oliver declares, that of all the various medicines which he has employed, he has never found one which operated so suddenly in hooping-cough; and Dr. Granville asserts, that in no case need hooping-cough be suffered to proceed longer than eight or ten days, if timely and cautious recourse be had to the prussic acid. We have, moreover, the evidence of Dr. John Elliotson, who has recently published an interesting work on the prussic acid, in favor of the good effects of this remedy in the present disease. He has also employed it successfully in a case of chorea; and in pyrosis and various other diseases of the stomach, he considers it a very valuable remedy. He does not, however, offer anything which goes to confirm the accounts that have been given of its curative powers in phthisis; and he fears that it must be added to our list of remedies that have been fruitlessly applied to the cure of this disease.

It has also been prescribed with advantage in asthma. Dr. Granville states that he has known it afford signal relief in this affection. Dr. Oliver also speaks of it as a valuable remedy in this disease.*

In chronic rheumatism the prussic acid has been employed with evident advantage. Dr. Coates,† of this city, in a statement of the result of the use of the prussic acid in the Pennsylvania Hospital, in the summer of 1819, observes, that "in two cases of severe chronic rheumatism, and in one of mania, the prussic acid was eminently serviceable, and in combination with subsidiary means, effected permanent cures."

Dr. Magendie prefers the pure prussic acid, as prepared by the process of Gay Lussac, and diluted with six times its volume of distilled water, or eight times its weight of the same, to that prepared by Scheele's process, which is not sufficiently uniform in its powers, on account of the liberty which the process leaves to the preparer. The difficulty of procuring this acid of an uniform strength, and the still greater difficulty of preserving it from deterioration, has hitherto been a very great objection to its employment in practice. It is therefore very desirable that so valuable and powerful a remedy as this should be obtained in a more permanent form than the aqueous solution, which decomposes by light, by air, and by the water itself. Professor Thomas Cooper has introduced a preparation that promises to answer this purpose. The following is his process: into strong rectified alcohol,

* New England Medical Journal.

† American Medical Recorder, vol. iii. p. 145.

surrounded by ice, throw a quantity of the prussic acid gas, obtained from the prussiate of mercury. One ounce of such alcohol will, at 32° of Fahrenheit, absorb all the gas that can be procured from four hundred grains of prussiate of mercury slightly moistened with about fifty or sixty drops of muriatic acid, and exposed to a gentle lamp-heat in a small retort. Not more than two drops of this acid can be given in a day in doses of one-sixteenth art of a drop.*

Formulæ.

℞.—Acidi hydrocyanici gtt. viii;
G. Arab.,
Sacch. alb., āā ʒii.
Aq. fluvialis ℥viii.—M. Dose, a tablespoonful three or four times daily.

* The following very interesting remarks and experiments on the effects of hydrocyanic acid and its counter-poisons have been lately published by John Murray, Esq., F.L.S., M.W.S., &c.

"I had always found, that the violent headache which sometimes occurred in preparing hydrocyanic or prussic acid, was relived and removed by ammonia, which induced me to think that the antidote to that acid, and virulent and formidable poison, might be found in ammonia.

"A small portion of hydrocyanic acid was given to a healthy young rabbit, which proved fatal in ten minutes. Soon after its administration, the head declined on one side, violent spasms supervened, while the eye lost its lustre, and the animal died in dreadful convulsions.

"On dissection after death, the lobes of the lungs appeared paler than usual, coagulable lymph was found lining the trachea, as in cynanche trachealis, and the stomach was found inflamed near the pylorus. The brain was not examined.

"The muscular fibre was still excitable by volatile agency, but the excitability soon declined.

"A drop or two of hydrocyanic acid on the head of a frog soon proved fatal. The color promptly changed to an unwonted paleness.

"The sciatic nerves of the prepared limbs were moistened with hydrocyanic acid, but no suspension of the Voltaic excitement supervened. It was accompanied by a tremulous movement of the muscular fibre, connected with the lines of the nerves: and this spontaneous irritability seemed increased by the application of alcoholic solution of iodine.

"It is a singular fact, that not unfrequently an alcoholic solution of iodine dropped on the muscular fibre of a frog, excited phenomena similar to the action of the volatile apparatus. It seemed also to renew excitability when the susceptibility had declined or was lost.

"When the symptoms were verging to a fatal issue in a frog, a drop or two of ammonia on the head effectually restored the animal.

"A greater quantity of hydrocyanic acid was given to a young rabbit than

proved fatal in the cases detailed. Ammonia was occasionally applied to the mouth on a sponge. The animal exhibited no unhealthy symptom whatever.

"A considerable quantity of hydrocyanate of ammonia, with excess of base, was administered to another rabbit, but without any deleterious effect.

"Half a drachm of hydrocyanic acid was given to a healthy young rabbit. The effects were prompt. Respiration became laborious and difficult, with a grating in the throat; the eye lost its brilliancy, the head dropped; it raised a sharp cry, and was convulsed. Strong ammonia was dropped into the animal's mouth, and it was repeatedly moistened with a sponge dipped into ammonia. It almost instantly revived, and even licked repeatedly the finger which sometimes applied the ammonia, apparently quite sensible of the instant and continued relief afforded. The animal effectually recovered. Its lips were excoriated by the ammonia.

"Conscious of the complete antidote of this formidable poison found in ammonia, I took a quantity of hydrocyanic acid sufficient to produce violent headache, stupefaction, &c., but diluted ammonia afforded me instant relief. I occasionally applied it to the olfactory organs, and bathed the forehead.

"Since hydrocyanic acid has been introduced into our pharmacopœia, and employed in the phthisis pulmonalis, and accidental poisoning may be anticipated, it is of much moment to know an effectual barrier to its virulence; and such is my complete conviction of the antidote, that I would feel no hesitation whatever in taking a quantity sufficient to prove fatal, provided there stood by a skilful hand to administer the remedy."

CHAPTER X.

II. *Medicines that increase and equalize the Nervous Energy.*

ANTISPASMODICS.

Dr. Cullen, on entering into the general consideration of this class of remedies, says, "this is the most difficult subject that has occurred to me:" and it must be confessed, indeed, that there is no object of the materia medica surrounded with greater obscurity than the modus operandi of antispasmodics.

Spasms occur under such a variety of circumstances, and in such opposite states of the system, that almost every article in the materia medica may, under peculiar circumstances, act as an antispasmodic. Thus spasm may depend on general debility, in which case tonics and general stimulants are serviceable. On the other hand, spasm may also proceed from, or at least be attended by, a plethoric condition of the system, as is sometimes observed in hysteria, and then we derive advantage from bleeding. Thus, too, spasm very commonly arises from gastric irritation, in which case we resort to emetics and cathartics as the best antispasmodics. But although remedies of this kind may occasionally produce antispasmodic effects, yet they do this in an indirect manner; that is, by removing either the debility or the plethora, or the irritating cause upon which the spasm depends, and not by any indirect influence over irregular or morbid muscular contraction. They are, therefore, not to be ranked with the antispasmodics strictly so called, any more than venesection is to be placed with the stimulants, because, in certain states of congestion, its employment produces strength and fullness of the pulse.

There are, however, substances which seem to exercise a more direct influence over spasmodic muscular motion. Of the modus operandi of these medicines we know but very little; nor can the utmost ingenuity hope to remove the veil which covers this subject, until the physiology of muscular motion and nervous influence shall be better understood. All that can be said, with any degree of plausibility, on this point, is, that as the functions of the muscular system are not only under the influence, but probably directly dependent on those of the nervous system, we may infer

that the remedies which calm the irregular actions of the former, must do so by their action on the latter.

ASSAFETIDA.

This is the inspissated milky juice of a perennial plant, indigenous to Persia, and known to botanists by the name of ferula assafetida. It is brought to us in dry, hard pieces, somewhat unctuous to the feel, of a brownish or reddish color, interspersed occasionally with little shining tears of a whitish hue. Its odor is strong, fetid, and alliaceous, and its taste bitter and acrid. According to Pelletier, 100 parts of assafetida contain 65 parts of resin, 19.44 parts of gum, 11.66 of bassorin, 3.60 of volatile oil, with traces of supermalate of lime. In addition to these ingredients, Mr. Brande found it in a large proportion of saline matters.

Assafetida is one of our most penetrating nervine stimulants. Taken in a large dose it excites a more lively flow of the spirits, increases the action of the heart and arteries, and induces vertigo. It also acts as a gentle laxative; but its long-continued use is said to weaken the muscular power of the intestines.* I have, however, never observed such an effect from the use of this remedy, although I have frequently employed it for a long time and in large doses. It possesses considerable powers as an expectorant, and may be very usefully employed in cases where we wish to promote expectoration, and at the same time stimulate the general system, or allay spasms or nervous agitation.

As a palliative in nervous diseases, assafetida is one of our most efficacious remedies. To allay hysteric symptoms its employment is extremely common; nor do I know any other medicine more promptly beneficial in such cases than this one.

It may also be advantageously employed to obtain temporary relief in hypochondriasis. Independent of its cheering influence in this affection, it is useful by awakening the dormant sensibility of the system to the action of other remedies.

In the advanced stages of typhus, when the system is much debilitated, and subsultus tendinum, tremor and slight delirium exist, assafetida, given in combination with other and more permanent stimulants, is often of very great service.

It may also be employed with much benefit in all spasmodic affections of the alimentary canal, unattended by any active inflammation in this part.

Much was formerly said of its employment in asthma and

* Burdach's Arzneimittellehre, B. iii. s. 322.

croup, and there can be no doubt that it may frequently afford much relief in this disease. In the latter disease Miller recommends, in strong terms, a mixture* of this substance in powerful and repeated doses. In the advanced stage of this affection, when by a successful antiphlogistic treatment, the inflammatory condition of the system and of the parts affected has been considerably subdued, I have known the assafetida to do much good in relieving the dryness and hoarseness of the cough, and establishing a more healthy secretion from the lining membrane of the bronchia. In hooping-cough, also, assafetida will occasionally afford considerable advantage. I have, in a few cases, united this remedy with antimonials, so as to excite vomiting after a few doses had been taken; and it appeared to me that the relief obtained was both more complete and more permanent than is usually derived from emesis alone.

In spasmodic pains of the stomach and bowels from indigestion, assafetida is a remedy of very considerable importance.† In my own person I have found it particularly advantageous for the relief of such symptoms, when combined with small doses of opium. Richter states, that a combination of assafetida and ox-gall is one of the most effectual remedies we possess for correcting that morbid condition of the stomach which favors the formation of acid. "Some patients," says he, "are constantly tormented with acid, eat what they may, and even though they take nothing but animal food. In such cases equal parts of assafetida and ox-gall are of so great use, that I can now, from experience, recommend them almost as a specific."‡

Assafetida has also been recommended as an excellent remedy in chorea, occurring about the age of puberty in females. For this purpose it should be taken in large doses. Gunther states, that he succeeded in curing a case of this kind, by the use of this article, after many other approved modes of treatment had been ineffectually resorted to.

In cases of habitual costiveness, assafetida often acts as a useful and invigorating aperient. It is particularly serviceable when the torpor of the bowels is connected with nervous symptoms. In such cases this article may be very advantageously combined with the compound extract of colocynth.

Assafetida has been highly recommended in the treatment of caries.§ Given in large and frequent doses it is said to promote

* ℞.—G. assafœtida ʒii; aq. ammoniæ acetat. ℥i; aq. pulegii ℥iii. Solve. Dose, a tablespoonful every half hour to a child two years old.

† Cullen's Mat. Med., article Assafœt.

‡ Medical and Surgical Observations, p. 191.

§ Schmucker's Chirurgische Schriften. See, also, C. L. Smalz Beobach-

the exfoliation of the dead parts, and to improve the discharges. It is, however, of more unequivocal advantage in the cure of old and ill-conditioned ulcers; and it appears to be more especially efficacious in cases that are attended with a scrofulous or rheumatic habit of the body.*

Assafetida is given either in substance, emulsion or tincture. The dose in substance is from gr. iii to ℈i, or even more, according to the urgency of the symptoms. An emulsion of two drachms of assafetida, two yolks of eggs, eight ounces of water, and one ounce of syrup, is to be given in the dose of one or two tablespoonfuls, pro re natâ.

Formulæ.

℞.—G. assafœtid. ʒi;
— galban.,
— myrrh, āā ʒss;
Castor gr. xv.—M. Divide into two grain pills. Dose, from three to six, three or four times daily, in hysteria.

℞.—G. assafœt.,
— galban.,
— myrrh, āā ʒi;
Castor,
Camphor, āā ℈ss;
Bals. Peru q. s.—M. Divide into two grain pills. Dose, from four to ten pills.

℞.—Assafœt. ʒii;
P. ipecac.,
P. opii, āā gr. viii.—M. Divide into three grain pills. Dose, from four to ten, in spasmodic pains of the stomach and bowels.

GALBANUM.

This substance is the inspissated milky juice of a perennial plant indigenous to Africa, and known to botanists by the name of bubon galbanum.

Galbanum is a tenacious substance, of a whitish color when recent, changing to a yellowish red when old. When broken, it presents a variegated appearance from the number of white tears with which it is interspersed. Its taste is bitter and acrid, and its odor fetid and strong.

One-fourth of its weight will be dissolved if triturated with

tungen über die guten Würkungen des stinkender Asants by drusen-und knochengeschwülsten, auch bey dem Bienpasz. In Loder's Jour. f. Chir. ii. Bd. iv. st. No. 7.

* Burdach's Arzneimitt. Lebi., B. iii. 327.

wine, water, or vinegar. To effect a permanent suspension in these fluids the addition of half its weight of some mucilage, or the yolk of eggs, is necessary. The best solvent, however, is a mixture of two parts of rectified spirits and one of water; this will dissolve all but the impurities of this substance. According to Pelletier, 100 parts of galbanum contain 66.86 parts of resin, 19.28 of gum, 6.34 of volatile oil, with traces of supermalate of lime.

Galbanum has been a good deal recommended in hysteric affections: it is said to be particularly adapted to cases of this kind attended with a relaxed state of the system, and a deficiency or a suppression of the catamenia. I have never employed it in spasmodic diseases. But in one case of habitual asthma, attended with a troublesome cough, I have found it exceedingly useful.

In spasmodic and flatulent colic, galbanum will often afford very considerable advantage. For this purpose I have known it to be combined with the ol. ricini, with very good effect. In addition to its antispasmodic virtues, it possesses no inconsiderable expectorant powers. In the latter periods of pneumonia, attended with considerable cough, and a difficulty of expectorating the tough mucus of the bronchia, a solution of galbanum in vinegar of squills is said to act very beneficially.

It has been thought to possess very considerable deobstruent and discutient properties. It enters into the composition of Schmucker's visceral pills, so highly recommended by Richter and others in the cure of gutta serena.*

Externally galbanum is applied to discuss indolent tumors. Arnold (Hufeland's Journ. B. xxvi), and Kopp (Medical Observations, p. 104), speak very favorably of the employment of the tincture of galbanum in chronic inflammation of the eyes. A thin compress of linen to be saturated with the tincture, and applied over the eyes over night. I have resorted to this application in a few cases with very manifest advantage.

The gum is given in the form of pills in the dose of from ℈i to ʒi. Dose of the tincture is from ʒi to ʒiii.

* The following is Schmucker's formula:

℞.—G. galbani,
G. sagapeni,
Sapon. venet., āā ʒi;
Pulv. rhæi ʒss;
Tart. emet. in aq. font. q. s. sol. gr. xvi.
Succ. liquiritæ ʒi.—M. Fiant. pil. gr. i. Sumat quotid. No. xv.

GUM AMMONIACUM.

According to Willdenow, this is the inspissated juice of the *heracleum gummiferum*, an umbelliferous plant, indigenous to the interior parts of Africa, the desert of Barka, and the western regions of Egypt. Externally this substance is of a brownish, and internally of a whitish, reddish, or deep yellow color. It has a faint balsamic odor; its taste is nauseous, at first sweet, soon becoming bitter and acrid. It is composed of gum, resin, gluten, and some volatile oil. Neither water nor alcohol dissolves it completely. In vinegar, ethereal oils and nitric ether, it is, however, perfectly soluble.

The antispasmodic powers of this substance do not appear to be of much importance. In spasmodic colic it may, however, be given with much advantage. In this affection, when given in large doses, it not only tends to allay the spasm of the intestines, but also to promote their discharges. In chronic hysteria, connected with a cachectic state of the system and a deficiency of the catamenial discharges, it is very advantageously combined with tonics, and particularly with chalybeates.

This substance has been thought to possess very important deobstruent properties. It has, accordingly, been much recommended by the German physicians in obstructions of the glandular viscera of the abdomen, and for the cure of such affections as are more or less intimately connected with the derangement of those organs. Richter has employed this remedy, in combination with other medicines, with much success, in the cure of gutta serena; a disease which appears to be not unfrequently dependent on functional disorder of the abdominal viscera. "Experience," says this eminent writer, "confirms me more and more in the opinion that the cause of gutta serena is most frequently seated in the abdominal viscera, and daily justifies me more in recommending the use of deobstruent visceral medicines. I can affirm, that I have frequently performed a complete cure in cases where I hardly expected it, and in some where the disease had actually continued for several years."*

G. ammoniac has also been used in hypochondriasis, chronic rheumatism, caries, ulcers, and cutaneous eruptions. Richter states that, in incipient scrofulous consumption, attended with a languid and irritable state of the system, he has used this gum, in conjunction with tart. antimony and belladonna, with marked

* He recommends the following pills:

℞.—G. ammon., assafœtid., sapon. venet., rad. valerian. summitat. arnic., āā ʒii; tart. antim. gr. xviii; pil. pond. gr. ii; quarum sumat ter quotid. No. xv.

advantage. He administered it according to formula No. 1, given below.

G. ammoniacum has also been particularly recommended in hydropic affections, more especially anasarca, when attended with a feeble and relaxed habit of body. In cases of this kind, it may be very advantageously administered in union with squill and minute portions of calomel. As an external remedy, it enters into the composition of a variety of plasters; and forms an excellent application to discuss chronic and indolent swellings and glandular indurations. For this purpose it is softened by vinegar, or the vinegar of squills, and spread on leather.

Of its expectorant powers, which are very considerable, I shall speak particularly when I come to treat of that class of remedies.

The most agreeable way of exhibiting ammoniac is in the form of an emulsion. ʒii of this substance must be triturated with the yolk of an egg or ʒss of gum. Arab., gradually adding ʒiv of water. The dose of this is one or two tablespoonfuls every two or three hours. It is also conveniently given when dissolved in the liquor ammonii acetat. Two drachms of the former may be dissolved in three ounces of the latter.

Formulæ.

No. 1.

℞.—G. ammoniac.,
—galbani,
Extract. cicut., āā ʒi;
Tart. antimonii gr. x;
Pulv. herb. belladon. ʒss;
Conserv. rosar. ʒi.—M. Divide the mass into three grain pills. Dose, six pills three times daily.

No. 2.

℞.—G. ammoniac. ʒiss;
Pulv. rad. senegæ ʒii;
Sulph. aurant. antim. ʒss;
Rad. scillæ gr. xv;
Mucilag. q. s.—M. Divide into three grain pills. Take from three to six pills three times daily, in chronic catarrh, &c.

MUSK.

This substance is produced by a quadruped of the ruminant kind, called *moschus moschiferus*, a native of Thibet, Tartary, China, Siberia, and the kingdom of Tangut. The fluid which forms this substance is secreted principally by the male; that which is obtained from the female possesses but little odor. It

is secreted most copiously by the animal during its periods of venereal incalescence.

The bag in which the secretion is formed is situated immediately behind the umbilicus. It is about three inches long and of an oval shape, having one side convex and the other flat. The musk comes to us in round thin bladders, covered with light brown hairs of the size of a pigeon's egg. It consists of small grains of a dark brownish color, having a somewhat unctuous feel. Its odor is very peculiar, diffusive and durable, "and it has the curious property, when added in minute quantity, to augment the odor of other perfumes, without imparting its own." Its taste is bitter. It contains resin combined with volatile oil, a mucilaginous extractive matter, minute portions of albumen, gelatin, muriate of ammonia, and phosphate of soda.

Ætius is the first who mentioned this substance as an article of the materia medica. Since his time it has been generally regarded as a very important remedial article. It is undoubtedly one of the most diffusive, penetrating, though fugacious stimulants we possess. It acts particularly on the nervous system, giving a lively impulse to its powers, and a temporary exaltation both to the mental and corporeal energies. It elevates the pulse without increasing the heat of the body.

Cullen thought it the most powerful antispasmodic we possess, and there appears to be no reason to think that, in this respect, he has estimated its powers too highly. In all spasmodic affections it has accordingly been much employed, and its effects in this way have often been exceedingly useful. Dr. Cullen relates the case of a gentleman affected with spasms of the pharynx preventing deglutition, and almost respiration. This case was effectually relieved by this remedy, after a very great variety of other medicines had been used abortively. Dr. Owen relates a striking example of the efficacy of musk in an obstinate convulsive affection of a young lady.* Dr. Hilary speaks favorably of its

* This case occurred in a young lady, who, having received a slight electric shock from a charged vial, felt, in a few hours after, slight convulsive motions, which recurred once or twice a day. The convulsions gradually increased in violence, until they became very alarming. "Her fits always began by a disagreeable, and rather a painful sensation at her stomach; almost at the same instant her mouth and all her features became distorted. Her head was suddenly and violently drawn down to her breast, and the next moment backwards. Her legs, arms, and in short every muscle in her body, at one time or other of the fit, seemed to be violently agitated, and became spasmodically contracted. Her paroxysm used to continue ten or fifteen minutes, at the decline of which, as if nature was quite exhausted or overcome, her muscles became at once relaxed, and she fell into an hysteric fit of crying, which was

powers in the treatment of tetanus as it occurs in hot climates.* Dr. Richard Huck, also, adduces strong testimony in favor of its remedial effects in this disease. He gave it to the extent of half an ounce with a drachm of opium, in the course of twenty-four hours, and by this treatment cured a considerable number of tetanic patients.†

Dr. Wall states that he found this remedy highly efficacious in convulsive hiccups, given in the dose of ten grains.‡ When given in doses under six grains, he never saw it produce any perceptible advantage.

In spasmodic asthma, as well as in spasmodic croup, musk is a remedy of very considerable value. In the latter affection especially, its beneficial effects are often prompt and decisive. Hufeland, indeed, regards the musk as almost a specific in this malady; and the testimony of Harless, Schaffer and Wichmann is equally favorable to its usefulness in this complaint. In hysteric convulsions, prompt and decided relief may sometimes be derived from the use of musk, either by itself, or in conjunction with opium or assafetida. In eclampsia from nervous irritation, unattended with much sanguineous determination to the head, much benefit may sometimes be obtained from full doses of this antispasmodic. In the epileptic variety of this affection, however, that is, when the face is flushed, and the vessels of the head turgid, all stimulating remedies ought to be carefully avoided. Prompt and copious blood-letting is indispensable in such cases.

Its powers in the cure of mania, though recommended by several writers of high respectability, are more doubtful. In hysteric mania I have seen it given in one case with evident advantage; though its beneficial effects were but temporary.

From its antispasmodic powers it has, indeed, been employed in every variety of spasmodic disease:—in subsultus tendinum, epilepsy, spasmodic colic, spasms of the stomach, cholera, cynanche trachealis, asthma, and even in hydrophobia. Sachse declares that, in later stages of croup, he has employed this article with great advantage. Schuter administered it in conjunction with calomel in this affection; and Albers (De Trachitide infant.,

succeeded by a comfortable sleep." After oleum succini, with small doses of musk, valerian, opium, bark, steel, cold-bath, ether, castor, and the fetid gums, had all been tried ineffectually, he ordered her half a drachm of musk, to be taken every hour. "It was no sooner in the stomach, than the fit, at the beginning of which the first dose was taken, began to abate, and in a minute or two entirely went off. In four days she was entirely free from the disease."—*Med. Observat. and Inquir.*, vol. iii. p. 186.

* Cullen's Materia Medica.

† Medical Observations and Inquiries, vol. iii. p. 330.

‡ Philosoph. Trans., No. 474.

&c., p. 97) states that he derived signal advantage in the advanced period of the disease, attended with much prostration, from the use of a mixture of musk, calomel and kermes mineral. In bronchitis, also, after the inflammatory symptoms have been subdued, and there is much prostration, musk will often afford material benefit. In the erysipelas of new-born infants, this article has been used with decided advantage by Renard (Hufeland's Journ., vol. xxii. p. 87), and by Lutzelberger (Ibid., vol. xxxv. p. 119).

Berger, a Swedish physician, recommends musk as a highly efficacious remedy in hooping-cough. He gave it to children in doses of fifteen grains every six hours, and he asserts, that the fits of coughing were very generally prevented after six or eight doses had been taken.

In gout the good effects of this remedy are much extolled by Pringle and Cullen. "In another disease," says the latter, "I can vouch for the powers of musk, and that is in several circumstances of gout." When the gout falls upon the stomach, musk, according to this writer, is an invaluable remedy. In retrocedent gout affecting the stomach, lungs or head, large doses are said to give very speedy relief. Having never used it in this disease, I can say nothing either for or against its employment.

In the advanced stage of typhus, when great debility, subsultus tendinum, tremors, hiccup, delirium, pale urine, pale and cold skin, and a frequent, small and corded pulse are present, musk is one of our most valuable remedies. It is also a very useful medicine in the typhous stage of the exanthemata, as well as in the latter stages of peritonitis, enteritis and pneumonia, when typhoid symptoms supervene. Schmidt, a very respectable German writer, says that musk is particularly useful in the typhus of habitual drunkards.

Musk is said to afford much relief in the morbid vigilance which sometimes attends hypochondriasis. It has also been recommended in vertigo unconnected with any evident fullness of the cerebral vessels. This remedy has been employed with advantage in combination with opium or ammonia, to check the progress of mortification.*

Musk is generally given in substance, in doses of from six to thirty grains, repeated according to circumstances. It may also be exhibited in the form of a julep.†

* Observations on Gangrenes, Mortifications, &c., by C. White, F. R. S., 1790.

† ℞.—Mosch. ʒii;
Sacch. albi ʒi;
Pulv. g. Arab. ʒii;
Aq. font. ℥vi.—M. Dose, a tablespoonful every two or three hours.

There is an article made with the oil of amber and nitric acid, which, having nearly, if not altogether, the powers of musk, has received the name of artificial musk. It is made by pouring three and a half drachms of nitric acid on one drachm of ol. succini, and then carefully washing the product. The substance appears to be nearly equal in all respects to the natural musk, and is given in the same dose. In pertussis it has been highly recommended; and I have, in my own practice, found it decidedly useful in this disease.

Formulæ.

℞.—Moschi ℈i;
Muc. g. Arab. q. s.—M. Divide into twenty pills. Dose, from three to six every hour.

℞.—Moschi gr. x;
G. assafœtid. gr. xv;
Extract. hyoscyam. gr. iii.—M. Divide into ten pills. Dose, from two to four every four or six hours, in chronic hysteria, or hypochondriasis.

℞.—Assafœtid.,
G. guaiaci,
Extr. valerian., āā ʒi;
Moschi,
Carbonat. ammon., āā gr. x;
G. opii gr. v.—M. Divide into three grain pills. Dose, two to three pills every two or three hours, in hysteria.

CASTOR.

This substance is obtained from a small animal found in Canada, Poland, Russia, Siberia and the north of Germany, &c., and known to naturalists by the name of *castor fiber*. Near the anus of this animal, there are four small membranous bags, two of which are principal, and the other two accessory. These bags contain a fluid which thickens on being exposed to heat, and forms an unctuous concrete substance. It is this substance which forms the castor.

The castor has a brownish-black color, possessing a peculiar penetrating, disagreeable odor, and a taste somewhat bitter and sharp. The best castor is brought from Russia and Poland; it comes to us in large black bags, and has a very strong odor. It contains volatile oil, resin, mucilage, extractive matter, iron, and small portions of the carbonate of potash, lime, and ammonia. It contains, also, according to the analysis of Laugier, a small portion of benzoic acid.

It is said that castor manifests less activity in males than in females. Alexander (Med. Experim. and Observat.) took two drachms of it, without experiencing any other effect from it than disagreeable eructations; and Joerg (Material. zu einer kuinft. Heilmittel. ect., p. 274) noticed the same result, in some experiments made with it on himself. Richter observes, that it exerts a much more decided influence on the uterine system than musk. In general, its tendency to excite the ganglionic system of nerves is very considerable, although on the spinal and cerebral system, its effects are extremely slight. In torpor, and functional derangement of the abdominal and pelvic viscera, castor, when employed in full doses, sometimes produces excellent effects.

Castor was formerly esteemed as one of the most active articles of this class of remedies. Its reputation, however, as an antispasmodic, does not seem to be considerable at the present day. It was at one time regarded as possessing narcotic properties, but this opinion appears to be entirely without foundation.

In combination with assafetida and ether, I have very frequently employed it in hysteria. I have, also, occasionally given it by itself with considerable advantage in hysteric affections. To derive any advantage from it, however, it should be given in very large doses. Instead of giving from thirty to sixty drops of the tincture, as is commonly directed, I generally administer from two to three teaspoonfuls of it at a dose. It is particularly applicable in cases of hysteria, attended with severe spasmodic pains in the abdomen, or region of the uterus. In cases of this kind it may be very advantageously administered in union with laudanum. It is to be observed, however, that in some individuals, particularly in delicate and irritable habits with a tendency to febrile irritation, castor, even in moderate doses, is apt to give rise to very unpleasant symptoms, such as oppressed breathing, dryness and heat of the skin, flushed face, and anxiety in the region of the heart. In chronic hysteria, attended with a leucophlegmatic or chlorotic state of the system, I have known great benefit to be obtained from the employment of this article in conjunction with the phosphate of iron.

It often affords considerable relief in spasmodic and flatulent colic. It has also been recommended in asthma, epilepsy, vertigo, and in the delirium of typhus. Burdach speaks well of its employment in irregular labor pains.

Dr. M. Morris, physician to the Westminster Hospital, speaks very highly of the efficacy of this article, in combination with the Peruvian bark, in the cure of hooping-cough. He gave eight grains of castor and fifteen of the bark every four hours, with perfect success.*

* Med. Obser. and Inquir., vol. iii. p. 283.

Alcohol and proof spirit extract its active properties: water does so but feebly. It may be given in the form of tincture or in substance.

Formulæ.

℞.—Pulv. rhæi,
Magnes. carbon., āā ℈i;
Pulv. castor gr. viii.—M. To be taken at once. Richter states that in pains in the stomach and bowels, from acidity, this is a most excellent remedy.

℞.—Tinct. castori ℥ss;
Aq. ammon. ʒii;
Tinct. opii ʒi.—M. Dose, from thirty to forty drops.

ALLIUM SATIVUM.

This is one of the most diffusive vegetable stimulants we possess. Taken into the system, its peculiar odor very soon manifests itself in the perspiration, the urine, and the pulmonary exhalation. It contains an acrid ethereal oil, which readily inflames the skin, a viscid gummy substance, a sharp extractive matter, resin, and some salts.*

Garlic does not appear to possess any very important powers as an antispasmodic. It is, nevertheless, sometimes of considerable advantage in cases where expectorant and antispasmodic remedies are indicated. It is accordingly recommended in spasmodic asthma; and in pertussis and croup it is much in use as a domestic remedy. It cannot, however, be employed with safety in these diseases until the inflammatory symptoms have been subdued by depletory measures. In the advanced stage of croup, when the disease has lost its acute character, I have employed it, while practising in the country, with considerable advantage.

In chronic catarrhal affections, attended with a cold phlegmatic habit of body, this article is often very serviceable.

It is also recommended in the treatment of hysteria, gastric pains from flatulency, and nervous tremors. Dr. Chapman asserts that it is an exceedingly useful remedy in those vertiginous affections which sometimes trouble gouty and intemperate persons.

Its employment in the cure of intermittents, though sanctioned by the authority of Bergius, is of very little consequence. Garlic may be ranked, in this respect, with that host of unimportant articles which have at one time or other been employed to cure agues, and which, though no doubt sometimes serviceable, have not sufficient power to entitle them to any particular consideration.

* Pfaff.

Lind and Cullen recommend garlic in the cure of scurvy; and Sydenham speaks well of its powers in dropsy.

This substance is a very common domestic remedy for the expulsion of worms. I have known it to be given with decided advantage for this purpose. It is generally administered in the form of a decoction, with milk, on an empty stomach.

VALERIANA.

THERE is perhaps no medicine which has been more extravagantly praised on the one hand, and neglected on the other, than valerian. In some of the modern works on the materia medica it is not even mentioned, whilst in others its virtues are greatly extolled. That it possesses medicinal powers worthy of very considerable attention is, however, too well established to admit of a reasonable doubt.

The valerian is a perennial plant, indigenous to England and Germany. The root, which is the only part employed for medicinal purposes, is fibrous, with a central knob, and possesses a strong, peculiar, and unpleasant odor, and a warm, bitter, and subacrid taste. It contains gum, resin, fecula, extractive matter, and an essential oil possessing the peculiar odor of the root, but is considerably milder in taste.

The root of this plant, when growing on a dry and elevated soil, contains much more essential oil, and is therefore stronger than that which is found growing in low and moist grounds. It loses much of its strength by being kept long, and it ought to be preserved in closed vessels. In its general operation it acts as a stimulant, producing considerable antispasmodic effects. It excites the action of the heart and arteries, promotes perspiration and diuresis, and when taken in very large doses, produces anxiety, vomiting and purging.

For some time after Fabius Columna had cured himself of epilepsy by means of this substance, it was regarded as almost a specific in this disease. A more extensive experience, however, showed that, though not destitute of valuable properties, its powers had nevertheless been greatly overrated. At present, indeed, its reputation in this disease seems to be almost entirely gone. Alibert states, that he tried it with a number of epileptic patients in the Hospital St. Louis, and he assures us, that during an experience of six years, he obtained nothing but negative results.* By Quarin, however, this medicine is highly recommended in cases of epilepsy in infants, depending on some irritation; as, for

* Elémens de Thérapeutiques, &c.

instance, irritation produced by worms in the stomach and bowels; and Burdach* says, that it is particularly applicable in cases of this disease depending on a suppression of the catamenia in young females. Richter cured a case of epilepsy of more than four years' duration, in which a great many of the most approved remedies had been ineffectually employed, by the use of valerian in conjunction with the cajeput oil. He administered a drachm of the former, with three drops of the latter article, four times daily. The famous anti-epileptic powder of Ragoli contains a large proportion of valerian. According to Smelin it is composed of half a drachm of valerian, three grains of the muriate of ammonia, the same quantity of carbonate of magnesia, and two drops of cajeput oil; but according to Knopf's analysis, it consists of one drachm of valerian, a scruple of powdered orange leaves, two grains of muriate of ammonia, and four drops of cajeput oil. (Richter's Arzneimittellehre, vol. iii. p. 20.) Richter states, that he has known this mixture to be employed with entire success even in obstinate and inveterate cases of this malady. To be effectual in this complaint, valerian must be given in very large doses.

In hemicrania and vertigo assuming a regular periodical form, valerian has been recommended as an efficacious remedy by Cullen. Dr. Barton, also, adds his testimony in favor of its employment in this affection. Cullen, who placed considerable reliance on its antispasmodic powers, speaks favorably of its use in hysteria and other spasmodic diseases. In chronic hysteria in females of a cold, phlegmatic temperament, valerian in combination with bark is a valuable remedy. I have employed it in such cases with evident advantage. Hill,† who wrote a small book on the employment of this remedy in nervous disorders, speaks very highly of its powers in such complaints. In excessive nervous irritability of the stomach, unattended with inflammatory irritation, the oil of valerian dissolved in sulphuric ether, is, according to Richter, a remedy of great utility. In hysteric or nervous pains of the stomach or bowels, prompt relief may often be obtained by the use of the ammoniated tincture of valerian. (Berends.)

In every form of asthenic fever, valerian may be very generally employed with advantage. In typhus or nervous fever, either in its simple or complicated form, when there exists a spastic condition of the system, characterized by a small, quick, and frequent pulse, a rapid and short respiration, cold and pale skin, trembling and delirium, it has been recommended as very useful, when

* Burdach's Arzneimittellehre, B. iii. p. 342.

† Valerian, or the Virtues of that Root in nervous Disorders. London, 1758, 8vo.

given in large doses and combined with ammonia or bark. Vaidy considers it preferable to the cinchona in this disease. It appears, however, well established by the extensive experience of M. Chaumeton, that it is, upon the whole, considerably inferior to this latter article.*

A decoction of this root, administered in the form of a clyster, is strongly recommended by Horn, for the relief of tormina and tenesmus. It has also been much employed as a remedy in gutta serena. Both Richter and Schmucker speak favorably of its virtues in this disease.

The dose of the powder is from ʒss to ʒiii three or four times a day. It may also be given in the form of tincture, in the dose of ʒii—ℨss. The *ethereal tincture* is made by digesting one drachm of the root in an ounce of sulphuric ether. This is an excellent mode of prescribing valerian in hysteric affections. Dose, from twenty to forty drops. The infusion formed of ʒii of the root to ℨvii of water, is given in the dose of ℨii two, three, or four times a day. Decoction impairs the powers of this article. The ammoniated tincture is a very useful preparation. Its dose is ʒss—ℨii twice a day. The oil possesses the active properties of the root. It is given in doses of from six to twenty drops.

Formulæ.

℞.—Ol. valerian. ʒii;
Sulph. æther. ℨi.—M. Dose from twenty to forty drops.

℞.—Rad. valerian. ℨss;
—— calam. aromat. ʒiii;
Aq. fervid. ℨvi.—Stent. per ‡ horæ vase clauso. Colat. dein adde: Misturæ camph. ℨiss;
Sulph. æther. ʒii;
Syrup. limonis ℨi.—M. Dose, a tablespoonful in the advanced stage of typhus.

SYMPLOCARPUS FŒTIDA.—SKUNK-CABBAGE.

This is a very common plant in the United States. It grows in wet and marshy situations, and is easily recognized by its exceedingly offensive odor, being almost entirely similar to that of the skunk or polecat. The inflorescence which appears in April consists of a boat-shaped, inflated spathe, variegated with red and yellow spots, acute and incurved at the top, containing an oval spadix, having perfect tetrandrous flowers. The fruit, which consists of the maturated spadix, is a globular fleshy mass, containing large oval seeds. The spathe, with its spadix, is the first part of

* Alibert, Elémens de Thérapeutiques, tom. ii. p. 119.

the plant which appears above ground; the leaves afterwards shoot forth, and bear some resemblance to those of cabbage. This plant is perennial.

The skunk-cabbage possesses very considerable antispasmodic powers. Shœpf, speaking of the root of this plant, calls it "incidens, califaciens, expectorans," and mentions it as useful in phthisical coughs.

As a palliative in the attacks of spasmodic asthma, it is very highly recommended by the Rev. Dr. Cutler and others. I have, in several instances of this disease, derived very considerable advantage from the employment of this remedy. The powdered root, in the dose of from thirty to fifty grains, is to be given during the paroxysm, and repeated according to the urgency and obstinacy of the symptoms. The medicine ought to be continued for some time after the paroxysm has entirely subsided.

Dr. Thacher of Boston, states, on the authority of a correspondent, that two teaspoonfuls of the powdered root of this vegetable gave very prompt and effectual relief in a case of hysteria, after the ordinary remedies for such cases had been used without benefit. The same writer states that it has afforded much advantage in chronic rheumatism, in wandering spasmodic pains, and in hooping-cough. In chronic cough attended with a cold, phlegmatic habit of body, I have employed the powdered root of this plant with the most decided benefit. In an old man, who had been for many years afflicted with a very troublesome cough and difficulty of breathing, I found nothing to give so much relief as this substance, administered in forty-grain doses once or twice a day.

I was, indeed, much in the habit of prescribing this plant, while practising in the country, in cases of chronic catarrhal and asthmatic affections, and very generally with evident advantage. The seeds are said to be stronger than the root. "In spasmodic affections of the abdominal muscles during parturition, or after delivery, this root has proved an effectual remedy."* The plant should be kept in close stopped vessels, as its active properties seem to be of a very volatile nature. Decoction greatly impairs its virtues.

SULPHURIC ETHER.

Ethers are the product of the distillation of acids with alcohol. They are limpid, extremely volatile and light, very odorous and inflammable. The sulphuric ether is most commonly employed in medicine. It is of 739 sp. gr. and boils at the temperature of 98.°

* Thacher's Dispensatory.

When perfectly pure, this ether consists of oxygen, hydrogen, and carbon; "the rectified ether, however, still contains some water and alcohol, for Lovitz obtained an ether of 632." It is converted into a species of oil by soda and potash, and it robs metallic oxides of their oxygen. It is only partially soluble in water; but it unites in every proportion with ammonia and alcohol. It is a powerful solvent of oily and resinous substances, and "takes up about a twentieth part of its weight of sulphur."

This ether is an exceedingly diffusive stimulant. Its immediate operation is to excite the brain and nervous system, inducing as its secondary effect a considerable degree of stupor, listlessness, and disposition to sleep. Alibert observes, that when taken a long time, and in strong doses, it is capable of destroying the mucous lining of the digestive organs.*

This is one of the most important antispasmodics we possess for the cure of the hysteric paroxysm. When given in combination with opium, its beneficial effects in cases of this kind are generally prompt and decisive. It may also be usefully employed in various other spasmodic affections. It is capable of affording great relief in asthmatic complaints, or where dyspnœa arises from a spastic condition of the respiratory organs. In such cases the simple inhalation of the ethereal vapor is frequently sufficient to put a stop to, or at least greatly to mitigate, the difficulty of breathing. In catarrhal complaints attended with difficult respiration, I have sometimes directed the inhalation of this vapor with manifest benefit.

Alibert states that Pinel and he employed the inhalation of the vapor of sulphuric ether with great advantage in croup. In the spasmodic form of the disease, it often procures prompt and decisive relief, when employed in this way. In general, in all cases of difficulty of breathing, depending on nervous irritation, the inhalation of the vapor of ether will afford speedy relief.

* Dr. Robert Reid, of Dublin, a gentleman of eminence in the profession, in a very interesting paper, "On the Pathology and Treatment of Fever;" observes, "Ether acts directly as a sedative upon the spinal system. Some time since, I had an opportunity of seeing the sedative effects of this fluid on the spinal system remarkably evident in a case of tetanus. The patient had not been able to swallow the smallest quantity of anything for two days. I proposed that he should get a common enema, with the addition of one drachm of ether. This was done. In a few minutes the patient said he felt a warm glow within; the spasms totally relaxed; he sat up; complained of languor, and ate a bowl of jelly. The fluid is essentially different from alcohol in its effects on the animal economy, though the effect may appear stimulant in the first moment."(*a*)

(*a*) Transactions of the Association of the Fellows and Licentiates of the King and Queen's College of Physicians in Ireland, vol. iii. p. 56.

It is also given to check vomiting and sea-sickness; and has been used with advantage in hooping-cough, chorea, singultus, nervous headache and vertigo.

In the treatment of typhus this remedy has been a good deal employed in combination with other stimulants, and there can be no doubt that it may often act beneficially in this disease, especially when symptoms of spasm attend. It is obvious, however, from the transient nature of its effects, that it ought to be given in very frequently repeated doses; and even under its most advantageous mode of exhibition it can never be regarded otherwise than, at most, but a useful auxiliary in this disease. It has likewise been prescribed for the cure of intermittents.* Considerable importance has been ascribed to sulphuric ether as a remedy in traumatic tetanus. Gay states, that he employed it in conjunction with the essential oil of cinnamon, in several cases of this kind, with entire success. (Journ. de Med., Sept. 1812.) In some of the cases of tetanus, which occurred after the battle of Austerlitz, the remedy was employed with unequivocal advantage.

Richter states, that he prescribed sulphuric ether in very large doses (amounting at least to a tablespoonful) with complete success in a case of melancholia, caused by onanism. (Med. Chirurg. Obser., vol. ii. p. 828.)

Being the lightest and most evaporable fluid known, it produces in consequence of its rapid evaporation, a sudden and very great reduction of the temperature of those parts to which it is applied; and hence its external employment is capable of answering very useful purposes. Charles L. Smalz, physician at Pirna, has published some very interesting observations concerning the utility of this article as an external application in strangulated hernia. In two cases of this kind, after all the usual means of reduction had failed, ether was poured on the hernial tumor. From the cold produced by its evaporation, the hernia immediately softened, diminished, and was readily returned.† Many cases have since occurred to other practitioners, in which the application of the ether was found to produce similar good effects.

In rheumatism and gout also, the external application of this remedy has afforded very great relief. We are told by Sedillot, who has published a memoir on this subject (in the Recueil Periodique de la Société de Méd. de Paris), that the acetic ether is still more decidedly beneficial as an external remedy in rheumatism and gout, than the sulphuric ether.‡ A mixture of sulphuric

* Rochefort, Cours Elémentaire de Matière Médicale, vol. i. p. 118.

† Alibert, Elémens de Thérap., tom. ii. p. 144.

‡ Ibid.

and muriatic ethers evaporates with so great a rapidity, as to produce a degree of cold several degrees below 0 of Fahrenheit's thermometer. The liquor anodynus Hoffmani, is nothing else than sulphuric ether with the admixture of a small portion of alcohol and oil of wine. The sulphuric ether is liable, according to Gay Lussac, to undergo spontaneous decomposition, when kept a long time without disturbing it; "acetic acid, perhaps some alcohol, and a particular oil, are produced from it."

This article is given in the dose of ʒi—ʒiii, and repeated according to the exigencies of the case.

OLEUM SUCCINI.—OIL OF AMBER.

Amber, which affords this essential oil, is a solid bituminous substance, of a yellowish-brown color, clear and transparent, possessing very little taste or smell. It is dug out of the earth, and found along the coast of the Baltic and Mediterranean. This substance was much esteemed by the ancients, not only for its supposed remedial powers, but also as an ornament worn by the Roman ladies at their public games.

> ———stillataque sole rigescunt
> De ramis electra novis; quæ lucidus amnis
> Excepit et nuribus mittit gestanda latinis.
>
> Ovid. Met. L. ii. 1. 364.

Amber was called electrum by the ancients, from its property of becoming electric on being rubbed.

The essential oil obtained from it by distillation, possesses an acrid pungent taste and bituminous smell. It is very sparingly soluble in alcohol. When taken internally this oil evinces considerable stimulating properties; it heats the system and excites the secretions.

The oil of amber has been much recommended in tetanus, hysteria, and other spasmodic complaints. Dr. Rush employed it in a case of tetanus with very decided benefit. In France, a mixture consisting of equal parts of ol. succin., spirit. terebinth., and bals. copaiva, has lately been strongly recommended as a remedy in gleet, leucorrhœa, and nocturnal pollutions. The dose of this mixture is thirty drops, gradually increased to sixty, three times daily. Dr. Chapman says it is very useful in pyrosis, especially if attended with spasmodic pains. I have never employed this article in spasmodic affections, and can therefore give no opinion concerning its powers.

Hufeland speaks very highly of the good effects of amber in union with musk, in the cure of gangrene. Lentin also adds his

testimony in favor of its employment in this disorder. Liniments, of which this oil forms a principal part, have been used with advantage against fixed rheumatic pains, torpidity, and slight paralysis.

The oil of amber is given in doses of from ten to thirty drops. By the continental physicians it is frequently administered in union with caustic ammonia. Ten or fifteen drops of the oil are put into a glass containing a small portion of caustic ammonia, which is to be shaken until it becomes of a milky appearance.*

* Alibert.

CHAPTER XI.

E. MEDICINES WHOSE ACTION IS PRINCIPALLY MANIFESTED IN THE CIRCULATORY SYSTEM.

STIMULANTS.

The term stimulus, used in its most extensive signification, is applied to whatever agent is capable of exciting the vital energies, or, as it has been expressed, of producing sensation, motion, or thought. It is not, however, in this wide and indefinite sense, that this term is employed in the classification of the materia medica. It is restricted to the designation of those remedies which, without producing any evacuations, increase the action of the heart and arteries, and of the nervous power. The articles, however, which, according to the meaning of the term, come under the general title of stimulants, differ very materially from each other in relation to the particular effects which they produce in the animal economy. Thus, a certain set of remedial substances, besides their general stimulant effects, produce as secondary results, insensibility, sleep, and, if the dose be very large, apoplectic stupor and death. These are called narcotics, and appear to act more especially on the nervous system. Another set of stimulant remedies operates with great rapidity, producing an immediate, but transient increase of the action of the heart and arteries, and calm irregular muscular motions, by their power of exciting and equalizing the nervous energy. These are the *antispasmodics*. A third class of stimulant substances, acts more exclusively on the heart and arteries, producing a full, strong, and frequent pulse, a general warmth and fullness on the surface, and a temporary vigor of the general powers of the system, without manifesting any particular tendency to allay pain, or spasm, or to produce sleep and insensibility. These are the *incitants*, or stimulants properly so called; and constitute the class of remedies which is the object of the present chapter.

Stimulants, however, differ from each other, not only in rela-

tion to those general effects, by which they are distinguished into narcotics, anti-spasmodics, and incitants, but also in the more intimate or specific impressions which they produce in the animal economy. By Brown and his followers, it was imagined that the operation of all stimulating articles is essentially alike, and that they differ from each other simply in the degree of activity, which they possess. The hypothesis, however, could not stand long before the positive evidence of experience and observation; and it is now, I believe, almost universally abandoned. That stimulants, though agreeing in their general or obvious effects, are essentially diverse, as regards their specific impressions on the system, is sufficiently evident from the fact, that when the system becomes in a degree insensible to the impressions of one stimulus, from frequent repetition, it still retains nearly, if not entirely, its ordinary sensibility to the operation of another agent of the same kind. Thus, a person habituated to the use of ardent spirits, will be but triflingly affected by a dose of alcohol; which, in one of temperate habits, would produce very powerful effects, and yet both will be nearly equally affected by the same quantity of opium. If the excitement which these agents produce were not essentially diverse, it would be impossible to conceive how this circumstance could occur. But independent of considerations of this kind, the phenomena which result from the action of different stimulants, at once establish the fact of a radical discrepancy in the excitement which they produce upon the organization. By no management, for instance, can assafetida, alcohol, or any other stimulus be made to produce precisely the effects which result from a proper dose of opium.

What is here said in relation to stimulants, applies with equal propriety, to every article capable of affecting the animal economy. When two phenomena succeed each other, as cause and effect, their relation towards each other is positive. The one *necessarily* follows the other, and whilst the former remains the same, the latter cannot possibly vary. It is evident, therefore, that no agents that are in the slightest degree dissimilar in character, can affect the living system in exactly the same manner, and that the nature of the excitement produced by remedies must be as various as the remedies themselves. If these observations be correct, then the utility of a copious materia medica is at once obvious. For it cannot be doubted, that our means of controlling morbid excitement will be in proportion to the extent and variety of the impressions we are enabled to produce on the system.

As a general rule, stimulants are forbidden in all cases where bleeding is indicated. When debility is connected with much torpor and insensibility, as in the latter stage of typhus fever, it is

necessary to begin with large doses. Where, however, prostration depends on direct depletion, or is connected with an excitable state of the system, it is of the utmost importance to begin with small doses, and gradually to increase them, as the susceptibility to their influence is lessened by repetition.

The power of stimulants appears to be much enhanced by giving them in combination with each other. "There are, perhaps, no remedies," says Dr. Paris, "which receive greater mutual benefit by intermixture with each other, than the individuals which compose the class of stimulants; they not only thus acquire increased efficacy, but at the same time they lose much of their acrimony; if, for instance, any one spice, as the dried capsule of the capsicum, be taken into the stomach, it will excite a sense of heat and pain; in like manner will a quantity of pepper; but if an equivalent quantity of those two stimulants be given in combination, no such sense of pain is produced; but, on the contrary, a pleasant warmth is experienced, and a genial glow felt over the whole body; and if a greater number of spices be joined together, the chance of pain and inflammation being produced is still farther diminished.

CARBONAS AMMONIÆ.—VOLATILE ALKALI.

The carbonate of ammonia is obtained in the form of white semi-transparent masses, of a fibrous texture, and effloresing when exposed to the air. It has a pungent and peculiar odor, and an acrid taste. The degree of its solubility is not accurately ascertained. According to Mr. Phillips, it is soluble in four parts of cold water; Dr. Duncan says in two parts. It is insoluble in alcohol. When dissolved in boiling water, it undergoes a partial decomposition with effervescence.

The carbonate of ammonia is a very active stimulant, and may be employed as such in a variety of cases, with peculiar advantage. In typhus fever it has been particularly recommended by Huxham, Pringle, and others, and some have considered it superior in this disease to any other stimulant we possess. "In the more advanced stages of the disease," says Dr. Chapman, "when the indications of increased debility come on, the volatile alkali, either alone or in combination with opium and wine, is, of all the remedies which I have ever tried, one of the most decidedly useful." In my own practice, I have been much in the habit of employing this remedy, and it has appeared to me, in general, more beneficial in the advanced stages of typhus than any of the other stimulants usually resorted to in this disease. It may be given at a much earlier stage of the disease than other

remedies of this kind; for, instead of producing a hot and dry skin, like wine, camphor, &c., when given before the stage of excitement has passed by, it commonly excites a gentle diaphoresis, rendering the skin moist and comfortable, while the action of the heart and arteries is raised. "In one respect," says Dr. Chapman, "the volatile alkali differs from every article of the class to which it is attached, and, it would seem, from all other medicines. The peculiarity to which I allude is this, that the excitement it raises approaches more nearly to that of healthy action, and hence it may be recurred to earlier than stimulants generally, in the inflammatory affections."

In puerperal fever, when the inflammatory action has subsided and the system is sinking, ammonia has been much used, and it is undoubtedly one of our most important remedies in cases of this kind.

This remedy has also been recommended in the cure of pneumonia. In the latter stage of the disease, when, after much depletion, expectoration is imperfect, the pulse is small, and the skin dry, the volatile alkali is a remedy of unquestionably efficacy. It is obvious, however, that so long as bleeding is indicated, this, as well as all other stimulants, cannot be employed without much risk or injury. In the typhoid pneumonia which prevailed through the United States a few years ago, I often administered the ammonia in combination with a decoction of serpentaria, from the very commencement of the disease, with unequivocal advantage. In general the carbonate of ammonia may be regarded as a peculiarly useful stimulant, whenever a hot and dry state of the skin exists, with much prostration of the vital powers.

Ammonia may also be given with advantage in the latter periods of phthisis. "Where the cough is troublesome, the pulse weak, and great debility prevails, the exhibition of ammonia is attended with excellent effects. It does not flush the cheeks like most other stimulants."*

The volatile alkali has been much recommended in some affections of the alimentary canal. It is given in flatulent colic, unconnected with inflammation; and in cardialgia, depending on acidity in the primæ viæ, I have frequently known it to afford very speedy relief. Dr. Chapman states, that in the nervous or sick headache, "a dose of the volatile alkali will in some instances afford almost instantaneous relief." In the gastric affections which are common to persons of intemperate habits, this remedy is in general very beneficial. It is also said to produce excellent effects in diarrhœa and dysentery, depending on a debility of the intestinal canal.† In these affections it is usually given in com-

* Barton's MS. Lectures on Mat. Med.

† Burdach, Arzneimittellehre, vol. iii. p. 417.

bination with opium, and I have myself employed it in this way with benefit. It is only, however, in the chronic form of dysentery that we can venture on the employment of this remedy. When the discharges are not attended with much tormina, and seem to depend more on a relaxed, than on an inflammatory condition of the bowels, it will act very beneficially, not only by giving tone to the intestinal canal, but also by establishing a gentle diaphoresis, and, perhaps, by neutralizing acidity in the primæ viæ.

In chronic rheumatism, ammonia may often be used with considerable advantage. Dr. Barton employed the carbonate of ammonia with excellent effect in this disease.* It is more particularly applicable to those slight cases of wandering rheumatic pains and swelling, which remain as the sequelæ of an attack of the acute form of the disease. In several instances, after the inflammatory symptoms had been subdued by antiphlogistic measures, and pain and stiffness, with a small and irritable pulse, remained, I have given the aqua ammonia in doses of twenty drops, three or four times a day, with manifest advantage. I am at present treating a case in this way, and the effects of the remedy are such as to encourage me to proceed with it. Dr. Kuhn of this city, was in the habit of employing this remedy in regular gout.† According to Brande, (Mat. Med., p. 280,) a plaster composed of one part of carb. ammon. and three of extr. belladonna, forms a very efficacious application for allaying rheumatic or nervous pains.

In the treatment of humoral asthma, pertussis, and catarrhal affections, the volatile alkali has been a good deal recommended by some of the older writers. It does not, however, merit any particular attention in these affections.

Dr. Paris states, that he has found it very useful in hoarseness depending on a relaxed state of the throat. In the hoarseness which succeeds measles it is an excellent remedy.

This salt has also been applied to the treatment of croup. Grittfield caused his patients to respire the vapors of it, with the view of exciting cough, and thus expelling the membrane, commonly formed in the trachea. M. Rechon, a French physician, employed it both externally and internally in this disease; and, as he informs us, with much advantage.‡ No one at present, however, would, I hope, be willing to place any reliance on this remedy. Nothing but the most prompt employment of depletory

* MS. Lectures on Mat. Med. † Ibid.

‡ Observations et Reflexions sur le Croup; Recueil Periodique de la Société de Médecine, vol. xxii.—Traité de Matière Méd., par J. A. Schwilque, tom. i. p. 410.

measures, can be relied on with any degree of confidence in this formidable malady. Bleeding, emetics, calomel, and the warm bath, judiciously employed in the early stages of the disease, will in general rescue the patient from danger. After the inflammatory symptoms have been subdued, and a dry cough, with oppressed breathing and a harsh skin be present, the volatile alkali may, perhaps, be employed with some advantage. But in the first or inflammatory stages of the complaint, it would be the height of imprudence, I conceive, to use this remedy. It has also been prescribed in tetanus, epilepsy, and other convulsive diseases. In the treatment of apoplexy, especially, it was at one time a good deal recommended, but excepting in what has been called nervous apoplexy, or in that variety of the disease which is not connected with cephalic congestions, it is evidently an improper remedy. In cases attended with a pale countenance and a small and feeble pulse, the volatile alkali may be a very proper remedy; but where the vessels of the head are turgid with blood, and the face is livid and puffed up, we cannot employ stimulants without greatly endangering the patient's life.

This remedy has been highly recommended in the treatment of syphilitic affections. Peyrilhe, a French physician, speaks in extravagant terms of its efficacy in this disease;* but the experience of others has not yet confirmed the statements made by this writer. Rochefort says, that he gave the volatile alkali in venereal affections without ever deriving the least advantage from it.† This article has also been recently proposed, as a means of arresting hemorrhages. For this purpose the volatile alkali is to be dissolved in three times its weight of water, and applied to the bleeding vessels, by means of dossils of lint. Mr. Lapira, a Sicilian chemist, who first recommended its application in this way, made many experiments with it on sheep and dogs, and found it in some instances to arrest the bleeding from the divided crural arteries of these animals with much promptness.

The volatile alkali, in conjunction with guaiacum, is an excellent remedy in certain states of dropsy and in visceral obstructions. "I have succeeded," says Dr. Barton, "with this medicine when foxglove and squills made no impression on the disease."‡

To counteract the effects of the bites of venomous reptiles and insects, the volatile alkali was formerly considered a very efficacious remedy. It was first recommended for this purpose by M. Bernard de Jussieu, who states that he employed it with com-

* Essai sur la Vertu Anti-vénérienne des Alkalis volatiles.

† Cours Elémentaire de Matière Médicale, par Dem. Dubois de Rochefort, tom. i. p. 136.

‡ Barton's MS. Lectures.

plete success in the case of a student who was bitten by a viper. Dr. Ramsay, of South Carolina, has also recorded several instances of its successful use in cases of this kind; but the late Dr. Barton, who paid a good deal of attention to this subject, considered it as useless in this respect. The Abbé Fontaine, too, made a number of experiments in relation to the antidotal powers of this remedy, and the result of his experience is, that it is not only ineffectual, but in many cases evidently injurious. Larenti, who has also attended to this subject, found the volatile alkali entirely ineffectual in every case in which he tried it.*

The volatile alkali has moreover been applied to the treatment of cancerous affections. Martini, an Italian, and Hufeland, have published favorable accounts of its effects in this disease. Mr. Home also states, that he cured a scrofulous cancer of the lip, by administering fifteen drops of aq. ammon. three times a day, and gradually increasing it to forty drops. After using this remedy for three months, the ulcer was entirely healed. It is not, however, entitled to any particular attention in this respect. M. Patin asserts, that the acetate of ammonia is one of the most effectual remedies we possess for allaying the excruciating pains which attend carcinoma of the womb, and dysmenorrhœa. In the latter affection I have prescribed it in five or six cases, and always with signal benefit. It should be administered in full doses, and repeated every hour. (Rev. Méd., November, 1828.)

Aq. ammonia is said to possess the singular property of obviating the inebriating effects of alcoholic liquors. This fact was first publicly stated by Dr. Girard of Lyons. Dr. Chantourelle, who was appointed to make a report on this subject to the Medical Society of Paris, thought it might be supposed that this effect arose from the decomposition of the wine by the ammonia; chemical experiments, however, showed that such was not the case.† As an external remedy, this article will again be noticed when I come to speak of the rubefacients. It may be given either in the form of powder or julep.‡ The dose is from five to twenty grains. The incompatible substances are, sulphuric and nitric acids, nitrate of silver, acetate of lead, muriate of mercury, sulphate of zinc, tartarized iron, the fixed alkalies, lime, alum, magnesia, and sulphate of magnesia.

Officinal Preparations.—*Spiritus ammoniæ succinatus;* dose, from ten to thirty drops. *Spiritus ammoniæ aromaticus;* dose, from twenty to sixty drops. *Spiritus ammoniæ fœtidus.*

* Barton's MS. Lectures.

† London Med. and Phys. Journal, No. 270.

‡ ℞.—Ammon. carbonat. ʒss;
Aq. menth. pip. ʒvii;
Syrupi aurantii ℥ss.—M. Sumatur octava pars.

Formulæ.

℞.—Carbonat. ammoniæ ʒi;
Aq. fontanæ ℥vi;
Mucilag. g. Arab. ℥ss;
Syrup. zingiberis ʒi.—M. f. Dose, a tablespoonful.

℞.—Carb. ammoniæ ʒi;
Pulv. camph. ʒss;
Mucilag. g. Arab. ʒi;
Sacch. albi ʒiss;
Aq. cinnamom. ℥vi.—M. f. Dose, a tablespoonful.

℞.—Liq. ammon. succinat. ʒii;
Tinct. castor. ʒiii;
Æther. sulph. ʒi.—M. Dose, from twenty to forty drops.

OLEUM TEREBINTHINÆ.

This is a limpid essential oil, possessing a strong penetrating odor, and a hot, bitter, and pungent taste. In *hot* alcohol it dissolves without difficulty; but on suffering it to cool, it again separates. It is completely soluble in six parts of sulphuric ether. It unites with sulphur, wax, resins, and balsams, when exposed to a gentle heat. The alkalies have no action on it.

The oil of turpentine is an active and penetrating stimulus, and admits of a great variety of important remedial applications. It possesses diuretic and anthelmintic properties, and in large doses produces active purging. When taken in moderate doses, it increases the fullness and frequency of the pulse, and the heat of the skin without materially affecting the functions of the brain. In large doses, however, it produces a sense of fullness in the head, attended with vertigo, or a feeling of intoxication, and slight nausea. It appears to be speedily absorbed into the circulation, for whether injected into the rectum or received into the stomach, its peculiar odor is soon very perceptible in the breath, and to the urine it imparts the odor of violets. Employed in moderate and frequently repeated doses, it is apt to give rise to irritation of the urinary passage, amounting, sometimes, to violent strangury.

As a general stimulus in the low states of fever the turpentine is but seldom prescribed. It has, however, been recommended in the treatment of yellow fever, by some practitioners both of the West Indies and of the United States. Dr. Physick was, I believe, the first who employed it in this disease. He prescribed it, with much benefit, for allaying the irritability of the stomach, and consequent violent vomitings, which occur in this fever. It does not appear, however, from the experience of other practitioners, that it deserves any particular notice in this respect.

Lately the oil of turpentine has been much recommended as a remedy in puerperal fever. Dr. Brennan, of Dublin, was the first who administered it in this disease, and his report of his experience with it is very favorable.* Other English practitioners have since employed it with benefit in this dangerous malady; but I am not aware of its having, as yet, been employed with any particular advantage by the physicians of this country. Since the last edition of this work was published, I have prescribed the turpentine in nine or ten cases of this disease, and in most instances with decided benefit. I have generally administered it in conjunction with castor oil, in the proportion of three drachms of the turpentine to an ounce of the oil at a dose. I am entirely convinced, that after prompt and efficient blood-letting, very great advantage may often be obtained from the use of the turpentine and castor oil in this formidable malady. This remedy is particularly beneficial in that variety of puerperal fever which depends on intestinal irritation; and which, though not often attended with inflammation, strongly resembles genuine puerperal peritonitis.

In the treatment of epilepsy the spirit of turpentine is a valuable medicine. Dr. Latham speaks in high terms of its effects in this disease; and Dr. William Money, surgeon to the Royal Metropolitan Infirmary for sick children, employed it with advantage in cases of this kind.† Dr. Paris also thinks it may prove beneficial in cases of this kind by unloading the bowels, and by the peculiar cerebral excitement which it produces, when given in large doses, and which is evinced by a species of intoxication, "unaccompanied by that hilarity and elevation of thought that so usually follow the potation of spirituous liquors. I am inclined to believe, however, that it often acts beneficially in cases of this kind by destroying worms in the alimentary canal, a very frequent cause of epilepsy."

In uterine epilepsy—that is, in cases depending on catamenial disorders—this remedy is said to be particularly efficacious. Dr. Prichard declares that, according to his experience, the oil of turpentine is decidedly the best emmenagogue we possess in uterine epilepsy. He asserts, that he has employed the turpentine with entire success in cases of this kind, after various other remedies had been ineffectually used. In a case of epilepsy in a young lady, about twenty years old, who had never menstruated, I succeeded in establishing the catamenial function and arresting the disease, by the employment of the remedy, in conjunction with blood-letting, and the daily use of the hip-bath. In this case, one

* Transactions of the Fellows and Licentiates of the King and Queen's College of Physicians of Dublin.

† Medico-Chirurgical Review and Journal, Sept. 1822, p. 451.

drachm of turpentine was administered twice daily, until it produced severe strangury; after the strangury had subsided, the turpentine was again administered, until the same effect was produced, &c. In about two weeks after the commencement of this treatment the menses began to flow, and the epileptic attacks ceased to return.

Turpentine is a medicine of very considerable utility in chronic rheumatism. In sciatica, especially, it was employed with much success by Dr. Cheyne and Dr. Francis Home.* Of its efficacy in this form of rheumatism I have, in several instances, had unequivocal evidence. Cheyne gave it with honey, in doses of from one to four drachms, three times a day. Home, however, used it in much smaller doses, and his success was not less than that of Dr. Cheyne. I have commonly given from twenty to thirty drops, three times a day, on sugar, and at the same time directed frictions with the camphor liniment, recommended by Home and Ferriar, for lumbago.†

This remedy has lately been much extolled for its efficacy in removing obstinate obstructions of the bowels. Dr. Kinglake gives an account of two cases in which the turpentine manifested decidedly beneficial powers. The first case was one of extreme obstinacy; "bleeding, the warm bath, blistering, lenient and brisk cathartics, with repeated clysters, were assiduously but unavailingly used. The case appeared almost hopeless, when the spirit of turpentine was administered in doses of two drachms, conjoined with half an ounce of castor oil, every two hours. The first and subsequent doses, to the number of four, remained on the stomach, when full and complete catharsis was produced"‡ Dr. Paris also adds his testimony in favor of the utility of turpentine in cases of this kind. "In obstinate constipation, depending on affections of the brain, I have lately had several opportunities of witnessing its beneficial effects. In an unfortunate instance of hydrocephalus acutus, in a boy of thirteen years of age, it brought away an accumulation of feculent matter, almost incredible as to quantity, after the total failure of the strongest doses of ordinary purgatives."§

In chronic cases, attended with flatulence, acid eructations, a sallow countenance, a foul tongue, with griping and acrid stools, the oil of turpentine will frequently produce highly beneficial effects. Dr. Prichard declares, that he never employed any remedy with so much benefit as oil of turpentine, in cases attended with

* Clinical Experiments.

† Pulv. camph. ℈ii; ungt. basilic. ℥i; sapon. commun. ℥iss; pulv. sem. sinap. ℈i. Fiat unguent.

‡ Lond. Med. and Phys. Journ., No. 271.

§ Pharmacologia, p. 540.

such a state of the bowels. "It occasions moderate and regular evacuations, corrects the tendency to a frequent repetition of griping and irritating stools, and relieves, or completely removes, flatulence. At the same time the oil of turpentine exerts a peculiar sedative or tranquilizing power on the nervous system; it lessens irritability, the disposition of starting and convulsive twitching of the muscular fibres, and promotes sleep."*

The oil of turpentine has also been successfully employed in tetanus. Dr. Hutchinson cured a case of idiopathic tetanus by administering half an ounce of the turpentine every two hours. Dr. Mott, of New York, also employed it with signal benefit in a traumatic case. He gave a teaspoonful of the turpentine every fifteen minutes, for two hours, when the spasms intermitted. It was then repeated at much longer intervals until one hundred and twenty teaspoonfuls were taken.

In certain diseases of the eye, the ol. turpentine appears to be a remedy of very excellent powers. In *iritis*, it has been frequently employed with the happiest effects. Drs. Carmichael and Guthrie administered it with decided benefit in cases of this disease; and Mr. Middlemore has more recently employed it "in ordinary iritis, with results fully confirmatory of the observations of the two former physicians." Mr. Middlemore strongly advises the use of a drachm of turpentine, two or three times daily, in cases where, after the acute symptoms have been relieved by mercury, there remains a slow disorganizing inflammation in the iris. The turpentine has been found equally beneficial in *choroidal* and *retinal* inflammation.

Formerly, the spirit of turpentine was frequently employed in hepatic obstructions, and especially in jaundice from the obstruction of the bile-ducts by biliary concretions. Its use in these affections is now, however, entirely neglected.

In the treatment of obstinate gleets, turpentine, administered internally, will often produce very good effects. I have also known it to be employed with success in gonorrhœa; but in recent cases it is too irritating to be early given in this affection.

As an external remedy turpentine admits of a great variety of useful applications. In the treatment of burns and scalds it is undoubtedly a remedy of great utility. Kentish, who first employed the turpentine in cases of this kind, directs that it be mixed with a portion of basilicon ointment, with which pieces of linen are to be spread and laid on the injured part, being careful not to let the ointment extend over the sound skin. When this is done very soon after the burn has been received, it hardly ever fails, in a short time, to remove the burning pain and violent in-

* Prichard on Disease of the Nervous System, p. 263.

flammation of the part, and to establish a regular suppuration. According to the experience of Dr. Geddings, the oil of turpentine is a valuable remedy for excessive salivation. He states that he has used it extensively for this purpose, both in hospital and private practice, "with the most satisfactory results." "It has also been much employed," he observes, "by several of our medical friends, whose testimony fully substantiates our good opinion." Two drachms of the turpentine should be diluted with eight ounces of thin gum Arabic mucilage, and used frequently during the day as a gargle. In some instances Dr. Geddings used the undiluted turpentine "with the same happy effects." It at first generally causes severe smarting, which, however, soon subsides, and becomes less and less at each successive application. (Am. Journ. of Med. Sciences, vol. vii. p. 266.)

Mixed with oil, and introduced on cotton into the ears, turpentine has been found serviceable in deafness arising from a diseased action of the ceruminiferous glands.*

I have already spoken of the vermifuge powers of this article, under the head of Anthelmintics; and I shall hereafter again have to notice it when I come to speak of rubefacients.

As an anthelmintic, turpentine is given in doses of from one to three ounces. When used as a stimulant or diuretic, it is given in doses of from ten to forty drops. Two ounces of the oil, incorporated with a pint of mucilage, form a very valuable clyster, in obstructions of the bowels and flatulent colic.

Dr. Nimmo recommends the following method for purifying the oil of turpentine for medical use, "without diminishing its efficacy, but greatly lessening its disagreeable taste and its injurious effects upon the kidneys:—To eight parts of the oil add one part of the strongest alcohol, and let them be well agitated; in a few minutes a separation takes place, the oil, unless very impure, falls to the bottom, and the alcohol, having dissolved the impurities, floats at the top. Pour off the alcoholic portion, add an equal quantity of alcohol as before, agitate, and separate the liquids. If this be repeated three or four times, the oil becomes nearly tasteless, almost without smell, and when a portion of it is evaporated, it leaves no residue." The oil, however, speedily undergoes alteration, and returns to its original state of greater or less impurity.

M. Vangelin has ascertained that if 100 parts of pure oil of turpentine in volume, and 20 parts of alcohol, be mixed together, they do not separate again by rest, but form a homogeneous fluid.

* Paris's Pharmacologia.

PHOSPHORUS.

Phosphorus is a compact substance, of a pale yellow color, readily cut with a knife, and exhibiting, when broken, a vitreous fracture. It is exceedingly combustible, inflaming at the medium temperature of the atmosphere. It has an acrid taste and a strong alliaceous odor. It becomes fluid when put in hot water, and assumes the appearance of an oil. Alcohol and water do not dissolve it; but in the essential and fat oils, and in sulphuric ether, it is quite soluble.

Phosphorus is one of the most active and penetrating excitants with which we are acquainted; producing, when incautiously taken, exceedingly violent and dangerous effects. When rubbed upon the skin it immediately creates a burning pain and inflammation of the part to which it is applied. Taken inwardly, in the dose of from one-eighth to one-fifth of a grain, it produces an agreeable warmth, and temporary vigor of the powers of the system, and increases very considerably the secretion of urine. In somewhat larger doses it produces restlessness, heat, an irritated and feverish pulse, furred tongue, engorgement of the vessels of the head, stricture and dryness in the breast, violent burning and pain in the stomach, nausea, and bilious vomiting. Two or three grains produce excruciating burning pains in the stomach and bowels, attended commonly with distressing vomiting and hiccup; a sinking of the powers, the pulse becoming gradually imperceptible, and the whole surface of the body cold, and death. The inflammation in the stomach and bowels is generally of small extent. The stomach is commonly found much distended, and the intestinal canal closely contracted in different places. It is said, that when given even in moderate doses, it is apt, on being long continued, to produce indurations in the stomach, chronic vomiting, constipation, atrophy, and death. Weikard states that he once gave to a paralytic patient two grains of phosphorus incorporated with some conserves. On the following day the dose was increased to three grains, and he proposed augmenting the dose progressively, when all at once, on the third night, the patient was seized with violent contractions. Blisters were applied, and copious draughts of mucilaginous drinks given. Nevertheless the patient sunk and died on the fourth day.* Brera relates a similar occurrence in his practice. He administered two grains to a paralytic woman. After the first dose she appeared to be better; on taking the fourth dose, however, she began to complain

* Alibert, Matières Médicales, &c., vol. i. p. 192.

of violent burning pain in the stomach and bowels, and in forty-eight hours after she died.*

Mentz, a German physician, is said to have been the first who published anything relative to the remedial employment of this article.† It is highly recommended by some authors in the treatment of typhus fever. Lobstein says, that when given in this disease, the effects frequently appear after four hours, but sometimes not till twenty-four. "The vital warmth returns, transpiration is restored, the pulse improves, the urine is voided freely, and commonly turbid, with a sediment; the abdomen loses its tension; the excrements have a sulphurous smell, and shine in the dark; the delirium ceases, and the patient recovers his recollection, the mental faculties return, and a beneficial sleep restores the strength in a few days."‡ I do not doubt that its cautious use in the latter stages of this disease may often be followed by salutary consequences. Still, however, as it is an exceedingly active substance, and apt to produce dangerous effects when improperly taken, its use should not be ventured on without the utmost caution. Burdach states that it is especially efficacious in the typhus of the exanthemata, where the eruption has receded, or does not come out sufficiently, from deficiency of action in the system.

Phosphorus has also been given with success in spasmodic and convulsive diseases. Handel mentions several cases of epilepsy which were cured by this remedy. He relates the case of a girl who had frequent attacks of epileptic convulsions, and who was entirely freed from the disease by taking, in a mistake, some water out of a phial containing phosphorus. Instructed by this case, he says that he afterwards gave it to other epileptic patients, and with much success.§ Alibert, on the contrary, states that he gave this substance in one grain doses, every twenty-four hours, to six epileptic patients, and continued its use for nearly two months, not only without deriving any advantage, but, in the majority of cases, with evident injury. Lobstein, who appears to have paid great attention to the remedial employment of phosphorus, attributes the dangerous effects which have been observed to arise from its use, to the improper mode in which it has been usually administered; namely, in pills, electuaries, or emulsions. Its

* Brera, Rifflessione Medico-prattische sull' uso interno de Fosforo. Pavia, 1798.

† Menzius, Dissertatio de Phosphori loco Medicinæ Assumti Virtute Medica. Wittemb., 1761—in Haller's Disp. Pathol., tom. vii. p. 288.

‡ J. F. D. Lobstein, Récherches et Observations sur le Phosphore, à Strasburg, 1815. Vide Lond. Med. and Phys. Journal, for October, 1816.

§ Alibert, Mat. Méd., vol. i. p. 192.

beneficial effects, he observes, are only produced when the remedy is completely dissolved in its vehicle. He found, from much experience, he says, that its solution in vitriolic ether, with the addition of some aromatic essential oil, is a safe and convenient mode of exhibiting this medicine. From one-eighth to one-fourth of a grain of the phosphorus may be thus given at a dose; and experience has shown, that one grain in twenty-four hours is, for the most part, quite sufficient. It is said that phosphorus agrees much better, and can be borne in larger doses, when the atmosphere is dry and clear, than in cold and damp weather. "It ought never to be taken on an empty stomach, but always an hour after the patient has taken nourishment; salad and acid food, and drink in general, even beer, are improper. To quench the thirst, a mucous solution of salep, with sweet and generous wine, is the best beverage; the patient must also refrain from drinking immediately after having taken phosphorus. In acute diseases, where there is commonly but little appetite, broth, with a little nutmeg, or vermicelli, sago, &c., may be taken; but in chronic disorders, where digestion is not impaired, veal, beef, and mutton, either boiled or roasted; also light vegetables, such as carrots, French beans, &c., are a fit diet. Cabbage, turnips, onions, radishes, rape, cole, peas, &c., must be avoided, causing a sensation of fullness in the region of the stomach, together with anxiety, insupportable heat, and often vomiting and diarrhœa. The food must neither be too hot nor too cold. In case the patient go out, it is of the greatest importance to be on his guard against catching cold, which is apt to occasion vertigo and diarrhœa, or a relapse."*

From what we know of this substance, therefore, there is much reason to believe that, in the hands of a prudent physician, and employed with the precautions mentioned above, it will be found a safe and valuable remedy.

ALCOHOL.

This is a colorless and transparent fluid, obtained from vinous liquors by distillation. Its specific gravity is ·815. It boils at the temperature of 176°, and does not congeal at any known degree of cold. It burns with a pale blue flame, and leaves no residue. In a state of perfect purity, alcohol consists of a combination of carbon, hydrogen and oxygen. "It dissolves soap, vegetable

* Lond. Med. and Phys. Journ. for Oct. 1816. See also Lobstein's Monograph, already referred to, and Lobstein Löebel's Observations in Horn's Archiv. 1810, B. ii. No. 2.

extract, sugar, oxalic acid, camphoric, tartaric, gallic, and benzoic acid; volatile oils, resins and balsams; it combines also with sulphur, and the pure fixed alkalies, but not with their carbonates."

Alcohol is an exceedingly active and diffusible stimulus. The effects which arise from its action on the living system are so well known, that it would be superfluous to give a description of them. Brodie, who made experiments with alcohol on living animals, concludes that it is not absorbed, and that its general effects depend on a sympathetic impression on the brain by means of the nerves of the stomach. This he infers from the following facts: 1. Animals that die from the action of alcohol exhibit a decided inflammation of the stomach, but the brain is never found inflamed. 2. The effects produced by this fluid follow its application so rapidly, that it would seem impossible that there could be time for its absorption. 3. Persons laboring under the influence of spirituous liquors are frequently restored by vomiting. 4. When alcohol is introduced into the stomach combined with rhubarb, this latter substance can never be detected in the urine when examined after death.* According to the experiments of Orfila, however, it appears that alcohol is sometimes absorbed into the circulation; and this opinion is corroborated by other authenticated facts.† Be this as it may, it is evident the phenomena, which result from an over-dose of alcohol, depend directly on the action which it exerts upon the sensorium commune. The effects which alcohol produces are, indeed, very analogous to those which arise from concussion or compression of the brain; and it is not improbable that the symptoms which arise from large draughts of alcoholic liquors, depend mainly on the inordinate flow of blood which they determine to the vessels of the brain, and the consequent compression of the organ.

Alcohol, in its pure state, is seldom employed as an internal remedy. In the various forms of ardent and vinous liquors, however, it is an exceedingly common remedy in all cases of general debility unaccompanied by local inflammations. In the treatment of typhus fever, brandy and wine have long been cou-

* Philosoph. Trans. for the year 1811, p. 178, first part.

† A singular fact of this kind is related by Dr. Cook, in his treatise on Nervous Diseases, (vol. i. p. 221,) on the authority of Mr. Carlisle: "A few years ago," says Dr. Cook, "a man was brought dead into the Westminster Hospital, who had just drunk a quart of gin for a wager. The evidence of death being quite conclusive, he was immediately examined; and within the lateral ventricles of the brain was found a considerable quantity of a limpid fluid, distinctly impregnated with gin, both to the sense of smell and taste; and even to the test of inflammability. The liquid appeared to the senses of the examining students as strong as one-third of gin to two-thirds of water."

sidered a principal remedy. When the stage of excitement is over, and stimulants are indicated, there is, indeed, no remedy more grateful and beneficial than the prudent use of generous wine. Where there is great prostration, it may be given in very large and repeated doses without inducing the slightest intoxicating effects. Whenever this is the case, and it produces a fuller, stronger and slower pulse, and renders the skin moist and of a natural warmth, we may be assured that its influence is beneficial. If, however, it render the pulse more frequent and corded, flush the countenance, and induce restlessness, delirium, thirst and a dry and burning skin, then its effects will be injurious, and we are admonished of the necessity of at once laying aside its use.

Wine has been employed with much advantage in tetanus. Rush says, "it should be given in quarts, and even in gallons daily." Currie saw a patient cured of this disease, in the Liverpool Infirmary, "by drinking nearly a quarter cask of Madeira wine." Dr. Hosack also speaks highly of wine in this disease, and advises its being given without any other stimulant.*

In the chronic form of bowel complaints, the use of the red wines, particularly of Port, is almost invariably attended with salutary effects. The slight astringency which these wines possess, renders them peculiarly serviceable in such cases; and wherever a stimulus is indicated, and a looseness of the bowels exists, they ought never to be neglected. During the state of convalescence from acute diseases, when the vital powers return slowly to their wonted vigor, wine may be employed with very great benefit. In the debility of old people, wine is especially useful; Pliny, speaking of its salutary effects, says:—

> ———vino aluntur vires, sanguis
> Calorque hominum.

And it has, indeed, been emphatically called, "the milk of old age."

In relaxed and cachectic subjects, the moderate enjoyment of wine is commonly attended with very agreeable and salutary effects. It imparts vigor to mind and body, and infuses a genial glow throughout the whole system. Ovid well understood its benign influence:—

> Vina parant animos, faciuntque caloribus aptos,
> Cura fugit multo, diluiturque mero.
> Tunct veniunt risus, tunc pauper cornua sumit,
> Tunc dolor et curæ, rugaque frontis abit,
> Tunc aperit mentes aevo rarissima nostro
> Simplicitas, artes excutiente Deo.

* Rush's Medical Inquiries, vol. i. p. 186.

Alcohol is also used as an external application to sprains and rheumatic swellings; diluted with water, it has been much recommended as an application to burns.

CAPSICUM ANNUUM.—RED PEPPER.

This is a native of South America; cultivated in large quantities in the West India Islands, and frequently, also, in our gardens, for the beauty of its red pods. The taste of the pods, which are the only parts of the plant employed either for medicinal or economical purposes, is exceedingly pungent and acrimonious. They contain an oily matter, extractive and fecula. Oersted has obtained the acrid principle of pepper separately, which appears to possess some of the characteristic properties of an alkali. The virtues of the capsicum are entirely extracted by alcohol and ether.

This substance is an active and agreeable stimulus, and admits of very useful remedial applications. Bergius recommends it as an effectual remedy in obstinate intermittent fevers, connected with much debility and torpor of the digestive organs and intestinal canal.

Capsicum has also been prescribed in the latter stages of typhus; and in certain circumstances of this disease, it undoubtedly is a very useful remedy, as I have in several instances experienced in my practice. When the alimentay canal becomes torpid, and ceases to expel the flatus, giving rise to symptoms of tympanitis, the capsicum, with spirits of turpentine, has afforded me very great advantages. I do not think, however, that this article is well calculated to answer our purposes, where we wish merely to excite the general powers of the system. It is, as Dr. Chapman correctly observes, more a *local* than a general and diffusive stimulant, and answers, therefore, exceedingly well, where general debility is accompanied by much torpor or relaxation of the alimentary canal.

In the treatment of cynanche maligna, capsicum has been much recommended, both as a gargle and an internal remedy. Mr. Stuart,* in particular, speaks very highly of its powers in this disease. He directs "two tablespoonfuls of the small red pepper, or three of the common Cayenne pepper, and two teaspoonfuls of fine salt to be beaten into a paste, on which half a pint of boiling water is to be poured, and strained off when cold; an equal quantity of very sharp vinegar being added to this infusion, a tablespoonful every half hour is a proper dose for an adult."

* Medical Commentaries, vol. xii.

Mr. Stephens gave it to four hundred patients laboring under this disease, and "it seemed to save some whose state had been thought desperate." It was also employed with great benefit in this disease by Mr. Collins. He observed, that swallowing the infusion produced slight convulsive motions, and a sensation of heat in the œsophagus and stomach, and in a short time after a general glow over the body was felt, without materially changing the state of the pulse. Mr. Collins also used this remedy successfully in intermittent fevers.*

Dr. Makitrick states, that he has found this medicine very serviceable "in that morbid disposition which he calls the cachexia Africana, and which he considers as a most frequent and fatal predisposition to disease among the slaves."

Capsicum has also been used in partial paralysis; and Dr. Wright says that it is an excellent remedy in lethargic affections.

Lately this medicine has been recommended as highly useful in the advanced stages of acute rheumatism. About five years ago I employed it in a case of this kind, in large and frequent doses, with evident advantage; and I have heard of other practitioners who have given it in this disease with favorable results.

Capsicum may be given in the form of pills or tincture. The dose of the powder is from ten to thirty grains.

CARYOPHYLLI AROMATICA.—CLOVES.

These are the unexpanded flower-buds of a beautiful tree of the family of myrtles, indigenous to the Molucca islands, and now carefully cultivated by the Dutch at Amboyna. The whole tree is strongly aromatic; but the flower-buds, which are collected in October and November, when they are still green, and dried in the sun, after having been exposed to smoke for a few days, are the only parts met with in commerce, or employed for domestic or medicinal purposes.

The taste of cloves is highly aromatic, pungent and permanent. Their odor is strong, fragrant and aromatic. By distillation, they yield about one-eighth their weight of an essential oil. Water extracts from them a nauseous and slightly astringent extract, containing very little of their peculiar aromatic taste. All its virtues are completely extracted by alcohol and ether.

Cloves are the most stimulating of all the aromatic remedies, and may be used with advantage in all cases where we wish to produce a strong local impression on the stomach. They have accordingly been frequently prescribed with very good effect in

* Wilson on Febrile Diseases, vol. ii. p. 141.

flatulent colic, and in cholera morbus. In the latter affection I have known the tincture of them administered with prompt relief to the patient. The cloves are, however, much more commonly employed as adjuncts to other remedies than in an uncombined state. The essential oil is used as a local application in toothache. They may be taken in doses of from five to fifteen grains.

ZINGIBER.—GINGER.

This is the root of a plant* growing spontaneously in the East Indies, and now abundantly cultivated in some parts of the West. The root is tuberous, a little compressed, and marked with irregular prolongations, which often give it a palmated appearance; the surface is of a pale or ash color, and sometimes purple. Its taste is exceedingly acrid, producing a glowing heat throughout the whole cavity of the mouth. Its odor is highly aromatic, frequently producing sneezing when held to the nose. It contains, according to Vauquelin, a peculiar acid, a resino-extractive matter, fecula, and an essential oil. The watery and alcoholic extracts are extremely acrid.

Ginger is a powerful, but not very diffusible stimulant, and appears to possess very useful remedial powers. In an atonic and torpid state of the alimentary canal, attended with colic pains and other dyspeptic symptoms, ginger often affords very great relief. The dyspeptic symptoms and pains in the stomach, which are common in gouty persons, are frequently relieved by taking the infusion of this root. It has also been employed with success in the cure of intermittent fevers, accompanied with torpor of the abdominal viscera;† and in hooping-cough, where the lungs are much oppressed with slime, it is said to be a remedy of very considerable utility.

It is usually given in the form of an infusion. By decoction its aroma is dissipated. The dose of the powder is from ten to wenty grains.‡

PIPER NIGRUM.—BLACK PEPPER.

Pepper contains, according to the analysis of Pfaff, a mild essential oil, having the peculiar odor of the pepper; a dark brown

* Amomum zingiber, *Linn.* † Burdach.

‡ *Ginger beer.*—"The following is the receipt by which this popular beverage is prepared. Take of lump sugar half a pound, cream of tartar half an ounce, bruised ginger an ounce, boiling water one gallon. Ferment for twenty-four hours with yeast."

extractive, possessing no acrimony; and a green, acrid inflammable resin. Alcohol and ether extract all its virtues, but water does so only partially.

Pepper is a very permanent and general stimulant, and may be employed in a variety of cases with considerable advantage. Lately it has been recommended as an efficacious remedy in intermittent fever. Dr. Louis Frank, privy counselor and principal physician to her majesty Maria, Duchess of Parma, has published a summary of his experience of the utility of black pepper in this disease, from which it appears that its powers in this respect are not inconsiderable. Dr. Frank states that, by the use of this remedy, fifty-four out of seventy patients were completely cured in a short time, without relapse. The mode in which he gave the pepper, was, to dip the seeds into mucilage of gum Arabic, and afterwards into some powdered colomba to disguise it, and then to administer them as pills. The dose is from five to eight pills twice a day.* None of his patients required more than from seventy to eighty pills for perfect recovery.

In an atonic and torpid state of the intestinal canal a few grains of pepper, swallowed two or three times a day, are often very beneficial. Pepper has also been employed in chronic rheumatism with good effects. It is, however, more frequently given in combination with other substances, particularly with tonic bitters; and it may be thus employed with much advantage in weakness of the digestive organs, paralysis and intermittent fever.†

* Journal Complémentaire du Dictionnaire des Sciences Médicales, No. 22.

† Ward's celebrated paste for fistula and piles, contains a large proportion of pepper. It is thus prepared. Take black pepper and elecampane powdered, of each ℥viii; powdered fennel seeds ℥xxii; honey and sugar, of each ℔i; beat, and mix them well together in a mortar. Dose, the size of a nutmeg, three times a day.

CHAPTER XII.

F. MEDICINES ACTING SPECIFICALLY UPON THE ORGANS OF SECRETION.

I. *Medicines that act on the Cutaneous Exhalants.*

DIAPHORETICS.

These are medicines that increase the natural transpiration by the cuticular exhalants. When they augment this discharge to such a degree as to produce sweat, they are called sudorifics: the term diaphoretic being usually applied to such articles as increase the insensible perspiration. But as these two terms express simply a stronger or weaker operation of the same kind, it is cus tomary, in classifications of the materia medica, to employ only the latter, as a general appellative for the remedies of this class.

Obstructed perspiration may depend on very opposite states of the general system. We find it connected with high febrile action, and also with a slow and languid circulation. It is evident, therefore, that the remedies, which are calculated to restore this function when its defect or loss is associated with high vascular action, must be very different from those which are calculated to excite it in an opposite state of the system. In the former case, our diaphoretics must be such as have a direct tendency to lessen the action of the heart and arteries, and at the same time to relax the mouths of the transpiratory vessels. Hence cold ablutions, refrigerants, antimonials and bleeding are very often directly and decidedly diaphoretic. When the arterial reaction is strong, and the skin very dry and hot, a draught of very cold water often causes free diaphoresis. Where, on the contrary, torpor of this function is accompanied with a languid circulation, and with a pale, shriveled and cold skin, recourse must be had to diaphoretics of a stimulant character. Although, perhaps, every stimulant may, under certain circumstances, produce sweating, simply by increasing the action of the heart and arteries, yet

it must not be supposed that the stimulant diaphoretics act solely by giving a general increase of momentum to the blood, since many of these remedies undoubtedly possess a peculiar tendency, not only to determine the circulation to the capillaries of the cuticular surface, without materially augmenting the action of the heart and arteries, but also specifically to excite the activity of the perspiratory vessels. Diaphoretics act either by relaxing the mouths of the transpiratory vessels, or by increasing their activity, or by establishing an increased flow of blood to them, or, finally, by at once producing both the former and the latter of these effects.

Although many of our diuretics are manifestly stimulant in their primary operation, yet by the increased evacuation which they produce, they are ultimately antiphlogistic in their effects. Those of the refrigerant class are eminently so, and they therefore constitute very important remedial means, in all acute febrile disorders. It is not, however, simply by depleting that they act beneficially in acute affections. Much advantage, it may be presumed, is derived from the evaporation and consequent abstraction of morbid heat which constantly takes place during diaphoresis. In this way a very considerable source of irritation is obviated. There is another effect by which these remedies do good, especially in the inflammatory affections of internal organs. They increase the flow of blood to the skin, and thereby relieve, in some degree, the internal inflamed vessels, by a kind of local abstraction from the affected organs.

Health is very intimately connected with the regular performance of the perspiratory function. Whenever the transpiration by the skin is suddenly checked, more or less derangement of the system is invariably the consequence. That portion of the circulating fluid which nature designs to be cast off by the cutaneous emunctories, as no longer fit for the purposes of the animal economy, is retained, and becomes a source of morbific irritation to the heart and other organs. That obstructed perspiration may prove detrimental to health in this way, can, I think, hardly be doubted; for it is obvious, that the accidental obstruction of any important emunctory must give rise to an accumulation of recrementitious elements of the blood, and impart to it morbific qualities. Frequently the injurious consequences that might result from the retention of the perspirable matter is, in part, if not wholly, obviated by the vicarious action of the internal emunctories, and particularly of the kidneys. There is, however, another mode in which the sudden suppression of the perspiratory discharge may excite morbid phenomena in the animal economy. It disturbs the regular current of the circulation; the blood retreats to the vessels of the internal organs, giving rise to congestions,

inflammation, and fever. One of the most frequent external causes of obstructed perspiration is exposure to a cold and humid atmosphere. When the body is exposed to the influence of this cause, the circulation in the subcutaneous vessels is immediately diminished, both in velocity and in volume, and the skin becomes pale, shrunk and cold. As a natural and necessary result of this condition of the circulation on the surface, the blood is repelled to the internal vessels, and much of that recrementitious fluid which nature intends, and the welfare of the economy requires, to be cast off by the skin, is retained in the system. There is, therefore, under these circumstances, a superabundant portion of deteriorated blood forced upon the heart, which, acting upon it as a preternatural stimulus, brings on, sooner or later, reaction, or the stage of febrile excitement.

From the manifest influence, therefore, of the perspiratory function over the health of the body, it is obvious that those remedies which are calculated to restore the regular action of the cutaneous exhalants, must be of much importance in the cure of diseases. Sudorifics have, indeed, been among the earliest and most common remedies in every nation. Valuable, however, as their judicious employment undoubtedly is, there is perhaps no other class of medicines which has been so frequently and perniciously abused in the treatment of diseases. Van Helmont and his followers, believing that acute diseases were to be cured by expelling some morbific matter after its proper concoction, employed the most stimulating sudorifics, together with high temperature, in every grade of febrile exacerbation. This practice appears to have been exceedingly common during the seventeenth and early part of the eighteenth century. It is easy to perceive that its effects must have been highly pernicious. It is not, however, to be concluded from this that diaphoretic remedies are injurious, even in the most vehement febrile excitement. Quite the contrary, indeed, is the fact; for diaphoresis is, perhaps, always salutary in fevers of high excitement, and the more so in proportion as the arterial action is vehement. The utility or perniciousness of this discharge, in acute disorders, depends on the means that are used to excite it. It is the employment of heating or stimulating remedies for this purpose that renders the practice so injurious. If we elicit perspiration by cool applications, or by the use of diaphoretics of the refrigerant kind, we in general derive unequivocal advantage from it.

Having premised these general observations concerning the nature and employment of diaphoretics, I come in the next place to say something relative to their particular application in certain diseases. Diaphoretics are, in general, strongly indicated in all those febrile affections which arise from the influence of atmo-

spheric vicissitudes. As the first link in the chain of morbid actions in diseases from this cause, is torpor of the perspiratory vessels, it is always of great consequence to attend to the full re-establishment of this important function in their treatment. In the phlegmasiæ, diaphoretics are indeed among our most common, and certainly also among our most useful remedial means, when judiciously employed. But it must not be forgotten, that where the febrile excitement runs very high, the *stimulating* diaphoretics will often do injury, unless the inordinate action of the heart and arteries be previously moderated by bleeding, and evacuations from the intestinal canal. It is not so, however, with the refrigerant or relaxing diaphoretics; these may be resorted to with advantage, in fevers of the most violent inflammatory excitement.

In the treatment of remittent and continued fevers, diaphoretics are among our most common and useful remedies. A hot and dry skin is invariably attended with augmented distress, in whatever disease it may occur. When this is the case, nothing affords so much relief to the patient as a free flow of the perspiration. In general, however, it is not necessary to excite copious sweating, as every advantage derivable from this source, may be obtained by a degree of diaphoresis just sufficient to keep the skin moist. Before resorting to remedies of this class, the contents of the alimentary canal should be well evacuated. An attention to this is especially necessary in cases where there is reason to suspect the existence of vitiated secretions in the bowels. When the action of the heart and arteries is of a high grade, recourse must be had to cooling applications, and to the refrigerant or relaxing diaphoretics, such as nitre, antimony, acids, &c. But in fevers of low vascular excitement, attended with a dry and burning skin, the stimulating diaphoretics must be used, in conjunction with relaxing applications to the external surface, such as cool or tepid affusions, &c. In the congestive forms of typhus, nothing is of greater importance than the application of such external means as are calculated to excite the action of the skin and subcutaneous vessels. The application of heat, by means of bladders or bottles filled with hot water, and the use of rubefacient frictions of the most active kind, tend in a powerful manner to draw from the congested vessels of the oppressed internal organs, and to re-establish the equilibrium of the circulation. Although we should endeavor to keep the skin soft and gently moist in every stage of typhus, copious sweating is not to be encouraged, except in the early stages of the complaint, before the system has become greatly debilitated.

The very intimate sympathetic connection which subsists between the cutaneous surface and the lungs, renders the employ-

ment of diaphoretics particularly proper in the treatment of the inflammatory affections of these organs. When the skin is moist with perspiration, the breathing is generally more free, the pain and distressful feeling in the throat less severe, and expectoration easier.

In incipient phthisis pulmonalis, the most important remedial means are such as tend to keep up a regular action of the cutaneous emunctories. It is for this purpose that flannel is worn next the skin, and that patients are directed to visit mild and equable climates.

In the treatment of acute rheumatism, diaphoretics are very commonly employed, and they are undoubtedly sometimes of much service. The advantages, however, arising from copious sweating in this disease, are generally but temporary. It mitigates, for a while, the violence of the pain, but is apt to produce much debility, and to render the system exceedingly sensible to the influence of atmospherical vicissitudes. Gentle diaphoresis is not liable to this objection; "and the employment of antimony, in conjunction with calomel and purgatives, or of antimony or ipecacuanha with opium in moderate doses, so as to produce a favorable determination to the surface, is entitled to our fullest regard in this disease."*

Some writers speak very favorably of the employment of diaphoretics in gout. It will certainly always be useful to preserve a moisture and comfortable temperature of the skin; but profuse sweating can seldom be of advantage, and must often do harm by increasing the susceptibility to the influence of atmospherical changes. Medicines of this class, as is observed by Dr. Scudamore, are also apt to weaken the digestive organs, a circumstance which is to be particularly avoided in this disease. Whether gout be primarily seated in the stomach or not, it is certain that it is invariably attended by much derangement of the digestive functions, and it is therefore a matter of some importance, when we wish to excite a diaphoresis, to use such articles of this class as have the least tendency to weaken the powers of the stomach. When the skin is hot and dry much relief may be obtained by sponging the body with tepid vinegar and water, by cool drink, and a moderate temperature.† I have known a gentleman who always, in his attacks of gout, derived much advantage from a weak infusion of the eupatorium perfoliatum, a plant which, along with its diaphoretic, possesses considerable tonic powers.

In no class of diseases are diaphoretics more certainly useful than in the bowel affections. Vogeler, Stoll, Akenside, and

* Scudamore on the Nature and Cure of Gout and Rheumatism.

† Ibid.

Richter, were among the first who particularly recommended sweating in the cure of dysentery. More recently, Dr. Moseley has bestowed the highest encomium on the sudorific plan of treating this affection. He affirms, "that the intermittent fever is not cured with more certainty by Peruvian bark, than dysentery by diaphoretics."*

As this disease is essentially connected with a congested and inflamed condition of the vessels of the intestinal canal, and as there exists a very intimate relation between the cutaneous capillaries and those of the intestinal organs, it is obvious, from the general effects of diaphoresis, that it must prove salutary in this affection. It will not only act as a general depletory measure, but also, in an especial manner, derive from the vessels of the affected parts, and thus aid very materially in the reduction of the disease. The influence of the morbid condition of the cutaneous exhalants on those of the bowels, and vice versa, is often manifested in a very conspicuous way. We observe, for instance, dysentery, diarrhœa, and inflammation of the bowels to ensue from the sudden suppression of perspiration; and on the contrary, these diseases, from whatever cause they may arise, are almost invariably attended with a dry skin. By exciting the cutaneous emunctories in these affections, therefore, we break the chain of morbid actions, equalize the circulation, and give an exit to those recrementitious matters which nature designs to be cast off by the skin, and the retention of which cannot but prove injurious to the animal economy. Useful, therefore, as the operation of appropriate diaphoretics evidently must be in dysentery, general experience does, nevertheless, not warrant us in attributing to them all the efficacy in this disease which some writers, and particularly Dr. Moseley, have ascribed to them. In cases which arise from the sudden application of cold to the body, sweating is undoubtedly our chief remedy. In the ordinary autumnal dysenteries, however, or in such as arise from the influence of marsh miasmata, our principal attention must be directed to the biliary organs, and to evacuations from the intestinal canal. After the contents of the bowels have been sufficiently evacuated by mild mercurial purgatives, and bleeding premised if the febrile excitement run high, diaphoretics are always highly useful. For this purpose small doses of opium, ipecacuanha and calomel answer exceedingly well. This combination tends at once to allay the local irritation and pain of the bowels, to correct the biliary secretion, and to determine the circulation to the surface and excite diaphoresis.

What has just been said of the utility of diaphoretics in

* Treatise on Tropical Diseases.

dysentery, may be applied with equal force to the treatment of diarrhœa. But as in this disease the intestinal exhalants are rather in a relaxed than in an inflamed state, diaphoresis is not often adequate of itself to give substantial relief. In addition to those remedies which excite the cutaneous emunctories, and determine the circulation to the external surface, it is generally necessary, also, to resort to such means as are calculated to restore tone to the intestinal exhalants; such as astringent and absorbent remedies. Where the diarrhœa depends on vitiated secretion, either of the biliary organs or intestinal glands, neither sweating nor astringents are of much service, unless they are aided by alterative doses of mild mercurial remedies, and gentle laxatives.

In the treatment of cholera infantum, considerable advantage may be obtained by exciting the action of the skin. Here, however, we can seldom employ diaphoretic remedies, on account of the extreme irritability of the stomach, characteristic of this disease; and we are therefore obliged, for this purpose, to resort to external means, such as stimulating or mild rubefacient frictions, the warm bath, flannel rollers applied tightly round the body, &c. The application of a broad flannel roller round the abdomen, is especially useful in the chronic form of this disease, as well as in protracted cases of diarrhœa and dysentery. "By this very simple expedient," says Dr. Chapman, "I have done great good in these complaints, having very much used it, as is well known, both in public and private practice, long before the appearances of Dr. Dewar's book, where it is particularly noticed."* Whatever plan of treatment we pursue in this disease, we shall derive essential advantage from the concomitant employment of such applications to the surface as are calculated to excite the action of the subcutaneous capillaries.

When we consider the intimate relation which exists between the functions of the skin and the kidneys, we would at once be led to expect advantage from the employment of diaphoretics in diabetes. Experience, however, does not furnish us with much evidence of their utility in this respect. A few cases are on record which yielded to the employment of such remedies. Cornick† and Werner‡ relate instances which were successfully treated with the pulvis ipecacuanha compositus, given in doses of from ten to thirty grains. But we know that opium has been

* Dr. Dewar's book entitled "*Observations on Diarrhœa and Dysentery, &c.,*" was first published in 1801. Dr. Chapman must therefore be mistaken, as to his having used the flannel roller, "both in private and in public practice, before the appearance of Dr. Dewar's book."

† Medical Commentaries, vol. x.

‡ London Medical Journal, 1790, vol. xi. p. 221.

used with success where no particular diaphoresis was produced, and we are therefore not fully warranted, in these cases, to ascribe the benefit derived from this powder to its diaphoretic operation. Dobson cured a case by the warm bath. As the skin is always remarkably dry and harsh in this disease, there can be little doubt that the warm bath or frictions would, in general, answer very well as auxiliary means.

Diaphoretics have also been employed in dropsy. It is, however, generally exceedingly difficult to excite sweating in affections of this kind, nor does the discharge, if it can be induced, often afford any particular relief. There is, nevertheless, very respectable testimony extant in favor of this practice, and it is said to be more especially useful in such cases of the disease as arise from obstructed perspiration, or appear as a consequence of measles, scarlatina, or rheumatism. Richter speaks well of the use of diaphoretics in cases of this kind.* Monro and Cotunnius employed Dover's powder and opium with antimonials, with success in dropsical affections;† and Frank‡ states, that warm bathing is one of our most efficacious means in cases connected with arthritic pains, or arising from repelled cutaneous eruptions. The ancients excited sweating, in dropsy, by burying the patient up to the neck in heated sand or ashes;§ and Lyson cured cases by placing patients in rooms heated to a very high temperature. I have never resorted to diaphoretics in dropsy, but I have no doubt that they may often prove serviceable, especially in such cases as depend on a primary disorder of the perspiratory function. Richter says that they may be advantageously employed in conjunction with diuretics.

Before dismissing this part of my subject, it will be proper to say something concerning the rules that are to be attended to in administering these remedies. When we wish to excite sweat, the patient must be confined to his bed. If the pulse is strong, full, and tense, venesection is to be premised. The state of the general system is to determine the choice of the diaphoretics to be used. When the action of the pulse is vehement, antimonials, neutral salts, acidulated drinks, cool ablutions, &c., must be employed. Where no inflammatory excitement is present, recourse must be had to stimulating diaphoretics. When the sweat once appears, it should be supported by copious draughts of gently stimulating drinks. The best time for using diaphoretics is after digestion is completed; during the performance of this function

* Specielle Therapie, tom. iii. p. 58.

† Observations on the Nature and Treatment of Dropsy.

‡ De Curand. Homin. Morbis., l. vi. p. 136.

§ Celsus de re Medicina, lib. iii. cap. 30.

the emunctories of the skin are less disposed to action. When the sweat flows, purging and bleeding must be avoided, as they have a tendency to check it. The temperature of the room should be kept at a medium point; and sudden transitions from a warm to a cold air carefully avoided after the sweating has subsided.

THE ANTIMONIAL PREPARATIONS.

The preparations of antimony deserve to be placed at the head of this class of remedies. When taken in large doses they all produce vomiting; but exhibited in minute portions, they excite the action of the cutaneous vessels, and give rise to a free transpiration by the skin. It is well known that all emetic substances are capable of exciting sweat when given in nauseating doses. Nausea is invariably accompanied by great relaxation of every irritable part of the system. The cutaneous exhalants especially, are always greatly relaxed, when under the influence of this feeling, and are thereby rendered more permeable to the watery portion of the blood. The diaphoretic operation of antimony does not, however, appear to depend altogether on its nauseating or relaxing effects; and in this respect it differs from the other diaphoretics taken from the class of emetics. It does not appear, for instance, that ipecacuanha has any tendency to excite the vessels of the skin when given in doses insufficient to produce nausea. Antimony, however, possesses a direct and specific influence upon the capillaries of the skin, as is demonstrated by its occasional effect of removing obstinate cutaneous diseases, when exhibited in minute doses. Its effects upon the cutaneous exhalants, when given so as not to excite nausea, appear to be simply an increase of the insensible perspiration; when we desire to produce free sweating by the antimonial preparations, they must be given so as to cause some degree of sickness of the stomach. In all asthenic diseases the preparations of this metal are decidedly the best diaphoretics we possess. For, independently of the diaphoretic operation of tartarized antimony, it appears to possess the power of moderating the action of the heart and arteries*—a virtue which must render it particularly adapted to cases of high febrile excitement. But whether it be endued with sedative powers or not, certain it is, that it has not the least tendency to augment febrile irritation, and may, therefore, be employed during the most violent arterial excitement. It has been alleged that antimonials do most good in fevers, when they do not produce any *sensible* evacuation by the skin, or obvious diuresis.

* Balfour, Lenthois.

From my own observations upon this subject, I am inclined to believe that there is some foundation for this opinion, and the circumstance does not appear to me to be altogether inexplicable. The function of perspiration is more or less deranged in all febrile disorders, from the very commencement, throughout their whole course. Torpor of the cutaneous exhalants would appear, in many instances, to be the very first link in the chain of febrile actions. This is especially the case in those fevers which depend on atmospheric vicissitudes. It is evident, therefore, that the greater portion of those recrementitious elements which nature is constantly casting off in the form of perspiration, remains mingled with the mass of the blood, and becomes an additional source of febrile irritation. Now, whatever contributes most to restore the natural action of the cutaneous emunctories, must also most effectually obviate this source of irritation to the heart and arteries. This appears to me to be the point upon which the explanation of the circumstance in question turns. When antimonials are given in very minute doses, they augment that insensible discharge of matter, the uninterrupted elimination of which is essential to health. They promote the *natural* secretory action of the exhalants, and enable them to throw off, in a duly elaborated form, those substances which it is their function to separate from the general mass of the blood. When given, however, so as to produce copious sweating, they give rise, certainly, to a much greater discharge; but this discharge being more the result of relaxation of the exhalants, and a consequent readier transmission of the watery parts of the blood in a *crude* state, than of increased activity of the secretory excitement of these vessels, it does not so well answer those purposes in the animal economy which nature intends to fulfil by this emunctory. Sweat cannot be regarded as consisting entirely of recrementitious matter. It unquestionably contains a considerable portion of fluid, whose retention could not prove detrimental to the living economy. It is not so, however, with the matter that passes off by insensible transpiration. This being a product of regular secretion, and essential to the welfare of the animal economy, is necessarily wholly recrementitious. It is not to be supposed, however, that the regular discharge of the insensible transpiration will, in all instances, be as effectual as free sweating. The contrary is the fact. In all fevers connected with inflammation, especially of the internal organs, copious perspiration is beneficial both as a general depletory measure, and as a powerful means of deriving the circulation from the affected organs to the surface. But in idiopathic fevers, attended with a dry and constricted skin, and without any particular indication for direct depletion, more advantage is, in general, derived from antimonials when given in such doses

as are just sufficient to restore the ordinary action of the perspiratory vessels, and to give softness to the skin, than by pushing them to the extent of producing free sweating.

In the account given of antimonial preparations in a former part of this work,* I have already mentioned their use in chronic cutaneous eruptions, in which, indeed, they often display very important powers. When employed in diseases of this kind, they are always prescribed in such doses as produce a slow and insensible operation on the system. They probably prove benecial, chiefly by keeping up a regular discharge of the insensible transpiration by the skin.

As a diaphoretic, antimony is employed in various states of preparation. Formerly a great deal was thought of James's powder, a nostrum which, according to the analysis of Mr. Pearson, consists of phosphate of lime and antimony. M. Pulli, a French chemist, has made a very rigorous analysis of this substance; according to him, thirty-six grains of James's powder, contain fourteen grains of per-oxide of antimony, eight of phosphate of lime, nine of sulphate of potass, and seven of potass.† This preparation is recommended as peculiarly beneficial in febrile affections. Within a few years past, Dr. Cheyne of Dublin has published some observations concerning its employment in hydrocephalic and apoplectic cases, from which it would appear that it possesses an obvious tendency to diminish the flow of blood to the head and to remove the disposition to apoplexy.‡ In persons predisposed to apoplexy, or frequently alarmed by the usual precursory symptoms of this disease; such as a sense of fullness in the head, vertigo, indistinct vision, tinnitus aurium, &c., the long continued use of this remedy is said to prove highly useful. Dr. Cheyne recommends the following method of exhibiting James's powder, in cases of moderate determination of blood to the head. The patient is to begin with about two grains at bedtime, and to increase the dose by half a grain every night, until some sensible effect is produced upon the stomach, bowels, or skin. If it excite nausea, the dose must be reduced. When the skin becomes soft, or the bowels affected, the dose must not be further increased. Its use must be persisted in for a length of time. Dr. Cheyne says, that the addition of a little rhubarb to this powder renders it less apt to excite nausea. Drs. Crampton and Stoker, of Dublin, also mention its good effects in cases of this kind.

The pulvis antimonialis, which is an imitation of James's

* Vol. i. p. 64.

† Alibert, Elém. Thérap., tom. ii. p. 363.

‡ Dublin Hospital Reports, vol. i. 1818.

powder, is an excellent diaphoretic in febrile diseases. It is given in doses of from four to eight grains, repeated every third or fourth hour. When exhibited in larger doses it is apt, like all the antimonial preparations, to excite vomiting and purging. The kermes mineral, which is a hydro-sulphuret of antimony, is held in high esteem by the German and French physicians; and it is certainly entitled to much more attention than it appears to receive from the profession in England and in this country. It is better adapted than any other preparation of this metal, to cases that require a long continued use of antimonials, or where there is much weakness of the digestive organs. Its operation on the stomach is mild, and it may be given a long time without weakening this organ, or bringing on an increased disposition to nausea or vomiting. It is said to be particularly beneficial in obstinate scrofulous eruptions of the skin. It is chiefly in chronic disorders of the eruptive kind, that its good effects have been particularly noticed. As an emetic or diaphoretic in febrile disorders, it is at present seldom employed in any country. As an alterative, it is given in doses of from a half to one and a half grains, either alone, or in combination with guaiac, calomel, extract of cicuta, solanum dulcamara, &c. The precipitated sulphuret of antimony resembles kermes mineral, both in composition and medicinal properties. Its dose is from four to ten grains.

But of all the antimonial preparations, the tartar emetic is unquestionably the most valuable, in every point of view. It will seldom fail to produce diaphoresis when properly managed, and it is now almost the only preparation of this metal employed for this purpose. As a diaphoretic in febrile diseases, it is usually combined with some of the saline articles of this class. In union with nitre, it forms one of our most efficient refrigerant diaphoretics, and it is in this way that it is commonly prescribed for this purpose. When we take into consideration what has already been said concerning the sedative effects of this preparation, it must appear obvious that it is peculiarly calculated to do good in asthenic diseases. Given in doses of from one-twelfth to one-eighth of a grain, it has been known, in common with the other preparations of this metal, to produce excellent effects in chronic cutaneous affections. When employed for this purpose it may be advantageously combined with gum guaiacum, extract of cicuta, &c., or given dissolved in the infusions of sarsaparilla, solanum dulcamara, burdock, or sassafras root. It is a singular fact that tartarized antimony has its emetic powers greatly diminished by giving it in union with Peruvian bark. A knowledge of this circumstance may sometimes be turned to much advantage in prescribing this latter substance in intermittents. Cases of this disease are occasionally met with, in which the bark appears rather

to do harm than good, in consequence of a general inflammatory condition of the system. In such instances, we may unite the tartarized antimony with the bark, and administer it to the extent of from one to two grains every three or four hours without producing vomiting, but with a manifest antiphlogistic operation. When exhibited with the bark in cases of this kind, it keeps up an agreeable moisture of the skin, reduces inflammatory action, and thereby favors the febrifuge operation of the cinchona.*

I have already noticed the employment of very minute doses of this preparation in phthisis pulmonalis.† One grain of it dissolved in six or eight pints of water, and used exclusively as a common drink, is stated by M. Lenthois to have proved successful in a number of cases in his practice. I have used it in this way, in cases of incipient phthisis with very obvious advantage. Perhaps the very large quantity of water which is taken in this way may contribute something to its good effects. A very free use of bland drinks, with abstemiousness, will often do more toward restoring health in chronic inflammatory affections than any other remedies we possess.

RADIX IPECACUANHÆ.—DOVER'S POWDER.

This article is but seldom employed by itself as a diaphoretic, nor does it appear to display particular powers in this way. Its operation in augmenting the discharge by the skin depends, probably, entirely on its relaxing influence by the nausea it creates. It does not, certainly, evince any manifest diaphoretic powers, unless it be given in nauseating doses. Combined, however, with opium and vitriolated tartar, it helps to form one of our most valuable diaphoretics—the pulvis ipecacuanha compositus,‡ or Dover's powder, as it is usually called. "In this composition," says Dr. Paris, "the opium is so modified that it may be given with perfect safety and advantage in inflammatory affections accompanied with increased vascular action. It would seem that whilst the opium increases the force of the circulation, the ipecacuanha relaxes the exhalant vessels, and causes a copious diaphoresis. The sulphate of potass is also an important ingredient, for experience has fully proved that ipecac. and opium, in the same proportions, have not so powerful an effect without it." It seldom fails, by proper management, to excite free diaphoresis,

* Pfaff's System der Materia Medica, B. ii. p. 402.

† Vide p. 60.

‡ This composition consists of ipecacuanha one part, opium one part, and sulphate of potass eight parts.

and, in a variety of diseases, its effects are peculiarly serviceable. In the treatment of dysentery, after the bowels have been sufficiently evacuated by mild purgatives, it generally proves highly beneficial. It not only determines the circulation to the surface, but also allays the pain and irritation of the bowels by its anodyne properties. In obstinate cases it may be very advantageously combined with small doses of calomel, and given at regular intervals until the gums become tender.

In cholera infantum I have frequently employed small doses of calomel and Dover's powder, with the most favorable results. A quarter of a grain of the former with half a grain of the latter article may be given every half hour, to an infant under two years of age. I can confidently assert that I have much more frequently succeeded in arresting the vomiting and purging with these minute doses, than with the free doses of calomel usually prescribed in this disease.

In diarrhœa, too, a mixture of calomel and Dover's powder, after the operation of a gentle purgative, forms one of our most efficient remedies.

In chronic inflammation of the mucous membrane of the bowels, small doses of Dover's powder often produce very excellent effects. It may also be very beneficially administered in dyspepsia, attended with much gastro-intestinal irritation. In chronic catarrh, and bronchial consumption, this powder, when administered in small and repeated doses, often affords very considerable relief.

In arthritic affections, this composition is particularly useful. Given in small doses, two or three times in twenty-four hours, it proves a valuable remedy in the declining stage of acute rheumatism. It may, indeed, be employed with advantage in every variety of symptomatic fever, attended with much pain and a dry skin. I know of no remedy more useful in peripneumonic inflammations than this one, after proper venesection has been made. It at once assuages the pain and promotes diaphoresis and expectorations. Drs. Brook, Percival, Cheyne, and Crampton, speak highly of its efficacy in hydrocephalus. Of its powers in this disease I can say nothing from my own experience; I must confess that I should not be inclined to employ it, since opium, in whatever shape it be given, has a manifest tendency to increase the flow of blood to the head. Where the cephalic affection is purely sympathetic, depending on gastric irritation, opium given in this way may, perhaps, be serviceable. But in idiopathic hydrocephalus there would be reason to apprehend danger from its employment.

This powder has also been successfully used in the cure of

diabetes.* It does not appear, however, that its virtues in this respect are superior, or, indeed, even equal to simple opium. Favorable accounts have likewise been given of its effects in dropsy.†

It is given in doses of from five to fifteen grains. When taken with the view of exciting sweat, the patient should be cautioned not to drink anything for at least one hour after the powder is taken, as it is very apt to produce vomiting when this precaution is not attended to.

NITRAS POTASSÆ.

The nitrate of potass, or saltpetre, crystalizes in white, semi-transparent, six-sided, and flattened prisms, terminated, for the most part, by dihedral summits. It has a sharp, slightly bitter, and cool taste. It is soluble in seven parts of cold water, and in its own weight at 212°. Alcohol has no action whatever on it. It is not changed by exposure to the air. It is decomposed by alum, sulphate of magnesia, sulphuric acid, the sulphates of zinc, copper, and iron, and partially by the sulphate of soda at the temperature of 32°.

When nitre is taken in doses of from ten grains to fifteen, its effects are gently diaphoretic, diuretic, refrigerent, and sedative. In doses of from thirty to sixty grains it generally proves aperient; and when swallowed in much larger quantities, its effects are those of an acrid poison, producing violent and obstinate vomiting, bloody stools, with all the symptoms of gastric inflammation, convulsions, and death. Taken in very large doses, it often acts particularly and violently on the nervous system, giving rise to "a sort of intoxication, palsy, convulsions, and other nervous symptoms."‡ Dr. John Butler relates the case of a woman who became affected with a convulsive disease resembling chorea, after having swallowed by mistake two ounces of nitre.§

The diaphoretic effects of nitre are not very manifest, its operation in this way being commonly confined to an increase merely of the insensible perspiration. It possesses, however, an obvious tendency to moderate the action of the heart and arteries, and to diminish febrile heat; and it is consequently one of our most

* Cornick, Med. Comment., vol. x. Werner, London Med. Journal, 1790, vol. xi. pp. 111, 221.

† Dr. Chapman's Therapeutics, vol. i.

‡ Orfila, Directions for the Treatment of Persons who have taken Poison, p. 65.

§ Edinb. Med. and Phys. Journal, No. 53.

common and useful remedies in diseases attended with high vascular excitement. When employed for this purpose it is usually combined with emetic tartar, to which, occasionally, a small portion of calomel is added. The emetic tartar is a very important addition. It increases its diaphoretic operation, and adds very considerably to its general antiphlogistic powers. In fevers attended with derangement of the biliary organs, the nitre and emetic tartar are very advantageously combined with small doses of calomel.* By such a composition we excite at once the secretory functions of the skin and the liver, and moderate the action of the heart and arteries. In bilious remittents I commonly employ this medicine until the gums become slightly affected, interposing occasionally a saline purgative. As soon as this effect is induced, the disease often assumes a perfect intermission, or at least becomes much more mild and manageable in its progress. In simple inflammatory fevers, the calomel should be omitted. Dr. Wilson Philip speaks very highly of the effects of nitre in counteracting a tendency to inflammation in the advanced stages of indigestion. "Of all the medicines," he observes, "which I have employed to counteract the inflammatory tendency in the second stage of dyspepsia, I have found none equal to the nitrate of potass, taken in a considerable quantity of water, in which a little gum had been dissolved."† Selle,‡ Richter,§ and others recommended a saturated solution of nitre in brandy as one of the most effectual remedies in hemoptysis. A tablespoonful of it is to be given every half hour. Of late years, indeed, this article has been particularly extolled by some eminent Italian and French physicians, as a remedy for spontaneous hemorrhage. In uterine hemorrhage, especially, it often affords prompt and very decided relief. I have employed it in a few instances of hemoptysis, attended with a warm and dry skin, and a strong and full pulse, with advantage. From fifteen to twenty grains should be given, and repeated at intervals of from thirty minutes to two hours, according to the exigencies of the case.

In hydropic affections, attended with a full and vigorous pulse, and a warm and dry state of the skin, the nitrate of potass has been employed with decided advantage. It is most apt to prove beneficial in those cases which result from suppressed perspiration after an attack of scarlet fever or measles.

A solution of nitre in vinegar is strongly recommended by Mr.

* ℞.—Sal. nitri. ʒss; tart. antim. gr. i; calom. ppt. gr. iv. Divide in pilu. x, one to be given every two or three hours.

† Treatise on Indigestion, p. 222.

‡ Med. Clin.

§ Specielle Therapie, B. iii. s. 302.

Patterson as a remedy for scurvy. Mr. Cameron also employed this solution in a number of scorbutic cases which occurred among the convicts on board the *Ferguson* transport, with the most satisfactory results. Eight ounces of nitre were dissolved in about sixty ounces of vinegar, and of this solution an ounce was given from three to eight times daily.

When nitre has been taken in such quantities as to threaten dangerous consequences, the best treatment, according to Orfila, "consists in causing the patient to swallow a large quantity of sugar and water, of warm or cold water, or of a decoction of linseed or mallows; by this means the stomach is filled, vomiting caused, and the poison ejected." If symptoms of inflammation ensue, bleeding, together with leeching and blistering of the abdomen, and copious draughts of mucilaginous drinks must be resorted to.

PREPARATIONS OF AMMONIA.

The carbonate of ammonia has a very considerable tendency to increase the activity of the cutaneous exhalants. By itself, however, it is rarely employed as a diaphoretic; but saturated with the acetic or citric acids, it forms a pleasant and very useful medicine for this purpose. These preparations are usually given in doses of a tablespoonful every hour or two, and they seldom fail to excite a flow of perspiration, when assisted by warm and gently stimulating diluents. They seem to hold a middle rank between the relaxing or refrigerant and the stimulating diaphoretics. They do not stimulate or heat the system, nor yet depress or relax it in their primary operation. They tend certainly in a manifest manner, to moderate febrile excitement, but this appears to be the result simply of the increased discharge by the skin. In fevers attended with a dry and hot skin, and a very irritable state of the stomach, the acetate of ammonia, or spiritus mindereri, is peculiarly beneficial. It allays the irritability of this organ, and by promoting perspiration, moderates at once the action of the heart and arteries, and the febrile heat. When the arterial excitement is not of a very high grade, and the skin is torpid, a small portion of laudanum may be advantageously united with this preparation. In cases of this kind I have known the aqua ammonia, given in warm wine whey, in the proportion of about forty drops of the former to one pint of the latter, to produce excellent effects.

The acetate of ammonia is an excellent palliative in dysmenorrhœa, and uterine pains from other causes. I have frequently prescribed it in the former complaint, and in general with speedy and very decided relief.

Formula.

℞.—Spirit. mindereri ℥v;
Spirit. nitri. dulc. ℥ss;
Vin. antimon. ℥i;
Syrup. ℥ii.—M. Dose, a tablespoonful every hour or two.

This is an excellent antiphlogistic diaphoretic in febrile affections.

EUPATORIUM PERFOLIATUM.

This plant is indigenous to the United States, and well known by the various familiar names of boneset, crowswort, vegetable antimony, thoroughwort, &c. Its stem is erect, round, hairy, branching at the top, and rises to the height of from two to five feet. The leaves are horizontal, serrated, rugose, and gradually tapering off from the middle, where they are perforated by the stem to the extremities. The flowers are white, collected into large corymbs at the termination of the branches, and appear in July and August. It grows in low meadows and marshy places.

The whole plant is intensely bitter, "without astringency or acrimony." Its bitter extractive, in which the medicinal qualities of the plant appear to reside, is equally soluble in water and alcohol. The decoction forms copious precipitates with muriate of tin, nitrate of mercury, nitrate of silver, and acetate of lead. It contains a very small portion of tannin, as is evinced by the solution of isinglass forming a slight precipitate with its tincture.* From Dr. Anderson's experiments it would appear that the leaves are the most active parts of the plant.†

The eupatorium perfoliatum possesses important medicinal properties. When taken in large doses it excites vomiting and purging; in smaller doses it produces copious perspiration, and acts as a gentle tonic. It has been much recommended by some practitioners of the United States as a remedy in intermittents. Dr. Anderson states, that this remedy was used in nearly every case of intermittent that occurred in the New York Alms-house in 1812, instead of the Peruvian bark, and that it uniformly proved successful. I do not doubt that it has sometimes proved successful in this disease; but the result of my own experience with it does not lead me to form a very high opinion of it in this respect. I have known it to remove the disease in a few instances, by producing vomiting and copious perspiration. But in the great majority of cases in which I have tried it, no manifest advantage was obtained. It has also been administered with very good

* Bigelow's American Medical Botany, vol. i. p. 34.

† Inaugural Dissertation. New York, 1813.

effects in remitting fevers; and we have the testimony of Dr. Bard and Dr. Hosack in favor of its usefulness as a diaphoretic, in yellow fever. As a diaphoretic it may generally be employed with much benefit in catarrhal fevers. In slight cases of this kind, a weak infusion of it, drank warm on going to bed, will often remove the disease very speedily. It but very slightly increases the action of the heart and arteries, and may therefore be employed with advantage in every variety of inflammatory affection. In acute rheumatism the infusion of it, used as a common drink, produces very excellent effects. It seldom fails to excite a moderate diaphoresis, and by this effect to procure considerable relief to the patient. It can, however, be considered only as an auxiliary to more efficient remedies, and as such it is unquestionably an article of considerable consequence. In the epidemic typhoid pneumonia of the winters of 1812, 13, and 14, the eupatorium was a good deal employed by some practitioners, and its effects are stated to have been very salutary. It has also been recommended as a good medicine in obstinate cutaneous diseases. Dr. Barton speaks well of its powers in affections of this kind. Dr. Thacher says, that in anasarcous swellings of the extremities, depending on general debility, the alcoholic tincture of this plant "may be safely recommended as an excellent tonic."* Dr. Burgon, of Bucks county, in this state, has found it very useful in cases of anorexia consequent on drunkenness. "In such cases," he says, "I have used a cold infusion with evident benefit, and I prefer it to any article I have hitherto employed; it very speedily restores the tone of the stomach, and no unpleasant effects follow its administration."† Dr. Bigelow, also, adds his testimony in favor of its good effects as a tonic, in loss of appetite and other dyspeptic symptoms, as well as in general debility of the system." I have found it particularly useful in very old people laboring under indigestion; it gives tone to the stomach, and renders the skin soft and comfortable. The warm infusion, as is observed by Dr. Bigelow, is an excellent substitute for chamomile tea, to promote the operation of an emetic.

The powdered leaves are given in doses of from ten to twenty grains, as a tonic or diaphoretic; or an infusion made by pouring a quart of boiling water on two drachms of the leaves, may be used in draughts of about a gill every three or four hours.

For excellent figures and descriptions of this plant, see Dr. Bigelow's American Medical Botany, and Dr. Barton's Vegetable Materia Medica of the United States.

* The American Dispensatory.

† American Medical Recorder, vol. iii. p. 331.

ASCLEPIAS TUBEROSA.

This plant is a native of the United States, growing in dry and sandy soils, and well known as a domestic remedy by the familiar names of butterfly weed and pleurisy root. The root, which is the part employed for medicinal purposes, is large, fleshy, spindle-shaped, or branched, of a brownish color externally, and white and striated internally. It sends up numerous round, and generally decumbent stems, very hairy, and of a reddish color. The leaves are scattered, narrow, oblong, hairy, waved at the edge, having footstalks at the bottom, but none at the top. The flowers, collected into umbels at the top, are of a bright orange color, and appear in July and August.

The root of this plant has a slightly bitter taste, without any traces of astringency, and yields its active principles entirely to boiling water. Its effects upon the system are those of a diaphoretic and expectorant, without in the least heating the system, or materially exciting the action of the heart or arteries. It produces a gentle tonic operation, and, when given in large doses, proves mildly laxative. It is, indeed, one of our most useful indigenous medicinal vegetables, being applicable in every case where diaphoresis and expectoration are to be promoted. In pleurisy, catarrh, and other pulmonary complaints, this root often evinces highly beneficial powers. The late Dr. Barton spoke in favorable terms of its employment in affections of this kind; and Dr. Benjamin Parker, of Bradford, Massachusetts, as is stated by Dr. Thacher, has been led, from a very extensive experience with this root, to regard it "as possessing the peculiar and almost specific quality of acting on the organs of respiration, powerfully promoting suppressed expectoration, and thereby relieving the breathing of pleuritic patients in the most advanced stage of the disease.* He gave it in the form of a strong infusion, in doses of a teacupful every two or three hours. We have also the evidence of Dr. Bigelow in favor of the remedial powers of this article. "I am satisfied," says he, "of its utility as an expectorant medicine, and have seen no inconsiderable benefit arise from its use as a palliative in phthisis pulmonalis."†

While practising in Lancaster, I frequently employed this remedy in catarrhal affections, and generally with manifest advantage. I have also witnessed its good effects in pneumonia and phthisis pulmonalis; and in one case of acute rheumatism I prescribed it with much apparent benefit. The asclepias has

* Thacher's Dispensatory.

† American Medical Botany, vol. ii. p. 65.

also been recommended as a useful medicine in the fever, diarrhœa, and other distressing symptoms which frequently accompany dentition. Dr. Burgon, of Bucks county, speaks very highly of its powers in this respect. "It is peculiarly adapted to the diseases of children," he says, "as they freely take it, from its not possessing any disagreeable taste or smell." He recommends the following mode of administering it. Boil two drachms of this root, in a pint of fresh milk, down to three gills. An ounce of this is to be given two or three times in twenty-four hours. It very seldom fails to excite a copious perspiration, and at the same time proves gently laxative.* Dr. Burgon recommends it also in cholera infantum and marasmus.

This root may be given either in substance or in decoction. This latter is, however, considered the best mode of administering it. About a gill of the strong decoction may be taken two or three times a day. The powder is given in doses of from twenty to forty grains.

GUAIACUM OFFICINALE.

The guaiacum officinale is a considerable tree, indigenous to the West Indies and the Brazils. Both the wood and the resinous substance which exudes from incisions made into its trunk, possess important medicinal virtues. The wood is compact, heavy, of a yellowish color, and has but little smell, and a bitterish and slightly acrid taste when chewed. The gummy resinous substance, or gum guaiacum, comes to us in large irregular masses of a greenish-brown color; it is brittle, and exhibits a shining, uneven fracture. When reduced to powder it is of a grayish-white color, becoming greenish on being left exposed to the air. It melts in a moderate degree of heat, and becomes soft and tough when chewed. It has a sweetish bitter taste, and produces a peculiar sensation of acrimony in the fauces when swallowed. It has a very faint and peculiar balsamic odor, and when thrown upon hot coals evaporates in fumes, which are exceedingly irritating to the lungs. About nine parts out of a hundred of its substance are dissolved by water; ether dissolves about forty parts in the hundred, and alcohol ninety-five. It is readily soluble in the solutions of the alkalies and in their carbonates. The mineral acids dissolve, and at the same time decompose it,† being, therefore, incompatible with it. Nitric acid changes the tincture of guaiacum to a beautiful blue color;

* American Medical Recorder, vol. iii. p. 334.

† Paris's Pharmacologia.

which, by adding water, lets fall a copious precipitate of a light blue, but which soon turns to a green, and finally to a greenish-white color. With concentrated sulphuric acid it forms a dark carmine red solution, which throws down a lilac-colored sediment on adding water. According to Mr. Hatchett, gum guaiacum is a peculiar substance, possessing neither the characteristics of a resin nor of a gum.

Gum guaiacum acts as a pretty strong and general stimulant upon the system. It excites the action of the heart and arteries; increases the heat of the body; and promotes the serous excretions, especially those from the skin and lungs. When taken in very large doses it produces nausea, anxiety, purging, with violent pains in the abdomen, and deep sleep. Its continued use has been known to excite a gentle salivation.*

Guaiacum was first introduced into medical practice as a remedy in syphilitic affections. Many of the most celebrated medical writers of the preceding century recommend it as one of our most useful articles in cases of this kind. At present, however, it holds but a very subordinate rank among our anti-syphilitic remedies. Mr. Pearson, who had ample opportunities of estimating the value of medicines of this kind, says that "guaiacum will often suspend the progress of certain secondary symptoms of lues venerea, *for a short time;* such as ulcers of the tonsils, venereal eruptions, and even nodes; but that he never saw one single instance in which the powers of this medicine eradicated the venereal virus."† In the treatment of rheumatism, also, this article has been long considered as peculiarly serviceable; and it is unquestionably a remedy of very considerable value in this disease. In the acute form of this painful affection, after the inflammatory symptoms have been considerably subdued, and wandering pains and swellings of the joints continue to harass the patient, the volatile tincture of guaiacum will often afford great relief. It is occasionally also prescribed in gout; but its employment in this disease can only be resorted to with propriety during the intervals of the fits, as it is much too heating to be given in the paroxysm.‡ In gouty affections of the stomach, so frequently experienced in the irregular form of the disease, the volatile tincture of guaiacum is said to prove very serviceable. Many authors speak very favorably of the use of this remedy in old scrofulous affections and in various diseases of the skin. Mr. Pearson says, "I have given the decoction of guaiacum with the best effects, to a great number of patients, in cutaneous diseases, in ozæna, and scrofulous affections of the membranes and ligaments." In combination with sulphur,

* Burdach's Arzneimittel., B. iii. p. 163.

† On the Effects of Various Articles in the Cure of Lues Venerea, &c.

‡ Scudamore on Gout, p. 189.

antimony, mercury, dulcamara, &c., it has been recommended as an excellent remedy in tinea capitis, herpes and psora. It is also much prescribed in affections arising from the influence of mercury; and in such cases I have had several striking examples of its usefulness. In chronic catarrh, attended with a very copious mucous expectoration, important benefit may sometimes be derived from small doses of g. guaiacum in combination with minute portions of tart. antimony. (Double. Jour. Génér. de Méd., tom. xix. p. 278.) It has also been employed with entire success in anasarca depending on rheumatism. In hemorrhoidal affections, attended with a sluggish state of the system, and torpor of the bowels, guaiacum, in conjunction with sulphur, is said to be a remedy of very considerable value. The tincture of guaiacum has also been recommended in gutta serena, and in painful menstruation. Dr. Dewees, of this city, has been long in the habit of employing it in this latter affection; and he speaks with much confidence of its efficacy in this respect.

Sapo guacicinus.—According to the Prussian Pharmacopœia, this preparation is made by dissolving one part of caustic potass in two parts of water. This solution is to be heated, and as much powdered gum guaiacum added as it will dissolve. It is then strained and slowly evaporated until it acquires a consistence proper for forming it into pills. The German physicians speak very favorably of this preparation as a remedy in rheumatism, lithiasis, and torpor of the portal circulation.

The dose of gum guaiacum in substance is from gr. x to ʒss. The tincture is taken in doses of from one to two teaspoonfuls. It may also be very conveniently given in the form of an emulsion, made by rubbing the powdered gum with the yolks of eggs, and gradually adding water to it.*

Formulæ.

℞.—Rasuræ ligni guaiaci,
R. sarsaparillæ, āā ʒi;
— liquiritiæ ʒss;
P. sem. fœnicul. ʒi;
Aq. bullientis ℔ii.—Boil for half an hour, then strain. Dose, a wineglassful four or five times daily.

℞.—Liq. guaiaci ʒiii;
Stip. dulcamar.,
Rad. graminis, āā ʒss;
Sem. fœnicul. ʒi;
Aq. bullientis ℔ii.—Boil down to one pint, and strain. Dose, a wineglassful three or four times daily.

* *Jesuit drops.* This is nothing more than the elix. anti. venereum of Quincey, consisting of *guaiacum, balsam of copaiva*, and oil of sassafras, made into a tincture by spirit.

℞.—Pulv. gum. guaiaci,
Flor. sulph., āā ʒss;
Carbonat. potassæ ʒi.—M. Take a teaspoonful three times daily.

℞.—Gum. guaiaci ʒiii;
Mucilag. g. Arab. ʒiv; terent. affund.
Sensim. aq. menth. pip. ʒivss;
Syrup. zingiberis ʒss.—M. Take a tablespoonful three or four times daily.

DAPHNE MEZEREUM.

This is a low shrub, growing spontaneously in the high and woody parts of Spain, France, and the southern districts of Germany. The bark is the only part of this shrub employed for medicinal purposes. It is thin, light, externally of a reddish-gray, and internally of a yellowish-white color; the parenchyma or internal substance of the bark is of a dark green color. It has an acrid and burning taste, but no smell. It contains, besides extractive matter, an acrid resinous substance, which, according to Pfaff, bears a strong resemblance to the active principle of cantharides, to which the name of *daphnin* has since been given.* The bark of the root is much more active than that which is obtained from the stem or branches.

Applied to the skin in a fresh state or in powder, moistened with spirits or water, it produced inflammation and vesication, attended with a good deal of burning and smarting in the part. Taken internally in large doses it occasions vomiting, violent pain in the stomach, inflammation, gangrene, and death. In smaller, but full doses, it sometimes produces heat in the stomach, nausea, vomiting, griping pains, diarrhœa, vertigo, headache, weakness, anxiety, convulsions, &c. It affects the respiratory organs, giving rise to pain in the breast, difficulty of breathing, cough, and hoarseness. It promotes the secretory action of the kidneys; and has been known to bring on bloody urine. It also increases the activity of the cutaneous exhalants.†

The mezereon bark has been much recommended in a variety of affections. In obstinate diseases of the skin, it was formerly a good deal prescribed; and it has been particularly commended for its powers in affections depending on a syphilitic taint, or in such as arise from the injurious influence of mercurial remedies. Its reputation in this respect does not, however, appear to be very great at present. Mr. Pearson states that, "from all that he has been able to collect, in the course of many years' observation, he

* System der Materia Medica, B. iii. p. 195.
† Burdach's Arzneimittellehre, B. iii. p. 169.

feels himself authorized to assert unequivocally, that the mezereon has not the power of curing the venereal disease in any one stage, or under any one form." Some later writers have spoken more favorably of its powers in affections of this kind, and especially in the mercurial diseases. It has also been recommended in chronic cutaneous eruptions. Dr. Cullen states that he found it successful in diseases of this kind; and Dr. Pearson knew it to confer temporary benefit in an instance or two of lepra. I have not had a great deal of experience with this remedy myself, but from its effects in some old syphilitic complaints, in which I prescribed it, I am inclined to attribute to it considerable remedial virtues. Dr. Withering states that he has known this bark to produce very good effects in difficulty of swallowing. He mentions one case of this kind, of very long standing, which was entirely cured in two months by chewing the mezereon root.

Parry states that he has derived decided advantage from the external application of a decoction of this root in nodes, rheumatic indurations, and cancerous ulcers. Hill, also, speaks very favorably of this application in affections of this kind. I have employed cataplasms made with the decoction in chronic swellings of the knee-joint with evident benefit.

The best mode of exhibiting this remedy is in decoction. Half an ounce of the bark, with the same quantity of liquorice root, may be boiled in three pints of water down to a quart, and given in doses of half a gill four times a day.

Formula.

℞.—Cort. mezerei,
Stip. dulcamar., āā ℥iss;
Rad. arcti lappo.,
——sarsaparil., āā ℥iss;
Aq. ferv. ℔ii.—Boil down to one pint. Dose, a wineglassful three times daily.

SMILAX SARSAPARILLA.

This is a climbing plant growing in low and humid situations in various parts of South America, and in the western parts of the United States. The root, which is the only part employed in medicine, is composed of a great number of long and slender creeping radicles, of a yellowish-brown color externally, and white within. It has a slightly bitter and mucilaginous taste, but no odor. It contains fecula, in which its active properties appear to reside, and vegetable albumen. Boiling water readily and completely extracts its active principles.

The medicinal character of this root has been very variously

represented. According to some writers, it possesses no powers whatever; whilst others represent it as being endued with highly valuable properties. When first introduced into practice, it was strongly recommended as a remedy in venereal affections. It did not, however, long sustain its character in this respect. Cullen thought it unworthy of a place among the materia medica; and Pearson declares that "he feels himself authorized to assert, that the sarsaparilla has no power of curing any one form of the lues venerea." Lately, however, it has again come into notice, and many of the most respectable practitioners of the present day employ it, and speak of it as a medicine of very useful powers in complaints of this kind. It is thought to be particularly useful in those chronic venereal disorders which resist the influence of mercurial remedies, as well as in those affections which occasionally arise from the action of mercury. My own experience with this root has not been extensive; but from what I have seen, I am inclined to regard it as capable of affording considerable advantages, when employed as an auxiliary to other more efficient remedies.

It has also been recommended in scrofulous and rheumatic affections, and in some of the chronic diseases of the skin. Quarin regarded the decoction of sarsaparilla as the most useful remedy we possess in gout, when administered conjointly with antimonial remedies. Sydenham also considered it useful in the declining stage of this affection; and Scudamore says, it will sometimes prove beneficial during the state of convalescence. It is usually given in union with other articles of the same kind, particularly with guaiacum, mezereon, sassafras root, &c.*

According to the experience of Mr. Battley, of London, it appears that the active properties of sarsaparilla reside exclusively in the cortical part of the root, and that its virtues may be effectually extracted by infusion in cold water. The woody or central part possesses no medicinal powers whatever; and it follows, as Mr. Battley observes, "that when the cortical part has been materially injured, or when, in the preparation of the medicine, the ligneous part of the root has been chiefly regarded, the remedy so prepared must be, in a great measure, if not wholly, inefficacious."†

The decoctum sarsaparillæ compositum of the London and

* The once celebrated Lisbon diet drink is made according to the following formula:

℞.—R. sarsaparillæ, R. chinæ, āā ℥i; nucum juglandis corticesi caratum, No. xx; antimonii sulphureti ℥ii; lapidis pumicis pulverizati ℥i; aqua distillatæ ℔x. To be made into a decoction.

† London Medical Repository, for Feb. 1819.

Dublin Pharmacopœias, is taken in doses of from four to six ounces three or four times a day.

The *compound fluid extract of sarsaparilla* is a neat and very excellent preparation. It possesses all the active properties of the root, in a highly concentrated state; a tablespoonful being equivalent to half a pint of the ordinary decoction. I have used it in several instances, with decided benefit. From the smallness of the dose it is peculiarly adapted for administering this remedy to children. This preparation was, I believe, introduced by Mr. G. W. Carpenter, druggist, of this city, to whom we are indebted for several new and valuable medicinal preparations; and whose enterprise and intelligent zeal in the prosecution of pharmaceutic inquiries, entitle him to the confidence and patronage of the profession.

LAURUS SASSAFRAS.

The laurus sassafras is a very common tree throughout every part of the United States. Its bark has a fragrant smell, and an agreeable aromatic taste. It contains a large proportion of an essential oil, upon which its taste and odor, as well as its medicinal properties, appear to depend. It is said, also, to contain a small proportion of camphor and some resinous matter.* Its active principles are extracted both by alcohol and water. The watery infusion is red, possessing the peculiar odor and taste of the sassafras, and changes to an olive green color by the addition of sulphate of iron. The bark and pith of the young branches contain a great deal of mucilage. "A very small quantity of pith, infused in a glass of water, gives to the whole a ropy consistence, like the white of eggs. This mucilage has the uncommon quality that it is not precipitated, coagulated, or rendered turbid by alcohol."† This mucilage is an exceedingly good application in acute ophthalmia, and it is no less useful as a demulcent in catarrhal and dysenteric affections.

The sassafras was at one time held in very high esteem as a remedy in syphilis, cutaneous eruptions, scrofula, and rheumatism. At present, it is not much employed in practice, but I am convinced from my own experience with it, that it is entitled to much more attention than it now receives. Alibert speaks very favorably of its virtues in rheumatic affections. He administered it frequently at the Hôpital St. Louis, and it always appeared to him, he observes, to exert a manifest action on the cutaneous

* Pfaff's Mat. Med., vol. iv. p. 242.

† Bigelow's American Medical Botany, vol. ii. p. 145.

emunctories. He mentions a case of chronic rheumatism which yielded to the infusion of sassafras, after a great variety of other remedies had been tried ineffectually. He speaks, also, of two cases of gout in which the sassafras was employed with complete success.* I have known the long-continued use of an infusion of this article effectually to cure a case of inveterate rheumatism.

Sassafras enters as an ingredient into the decoctum sarsaparilla comp. It is generally employed in the form of an infusion; but the oil is the most efficient, and therefore the best preparation. When it is used it should be rubbed up with mucilage, sugar and water. The infusion of the flowers is also frequently employed.

XANTHOXYLUM FRAXINEUM.—PRICKLY ASH.

The prickly ash is a tall shrub, indigenous to the United States, in many parts of which it grows in considerable abundance. The bark is aromatic and very pungent to the taste, the pungency being perceived only after it has been held in the mouth for some time. The leaves are also considerably aromatic, but have not the pungency of the bark, and resemble those of the lemon-tree in odor. "The rind of the capsule is highly fragrant, imparting to the fingers, when rubbed between them, an odor much like the oil of lemons. The odorous portion is an essential oil residing in transparent vesicular points on the surface of the capsules, and about the margins of the leaves. The acrimony which resides in the bark, has its foundation in a different principle, being separated by decoction, but not by distillation."†

The bark of this shrub is a warm stimulant and diaphoretic, being analogous to mezereon and guaiacum both in its sensible and medicinal properties. In this country it has been a good deal employed as a remedy in chronic rheumatism, and I have no hesitation in saying, from my own experience, that it is a medicine of very considerable value in this complaint. Its continued use has been known to produce salivation. "A lady in Buckingham," says Dr. Burgon, "who had taken a considerable quantity of the tincture for rheumatism, was completely salivated by it, and challenged her physician with giving her mercury. I have heard much of its salivating, but have never witnessed this effect from its administration; chewing the capsules powerfully promotes the flow of saliva."‡ Dr. Bigelow states that he gave the

* Alibert, Nouveaux Elémens de Thérapeutique, tom. ii. p. 302.

† Bigelow's Amer. Med. Bot., vol. iii. p. 158.

‡ American Medical Recorder, vol. iii. p. 333.

bark of this shrub in doses of ten and twenty grains in rheumatism, with considerable advantage. "In one case," he observes, "it effectually removed the complaint in a few days;" but in some instances he found it entirely ineffectual.* I once employed this remedy in a case of rheumatism attended with an obstinate eruption on the skin, and succeeded perfectly in relieving both these affections. I had reason to believe that the disease depended on a syphilitic taint.

This article has also been recommended as an excellent remedy in malignant ulcers. For this purpose it is used both internally and externally. Several instances of its efficacy in this respect are related in the Medical and Physical Journal, and in the Transactions of the Medical Society of London. It has also been found very useful as a topical stimulant.

It is generally given in decoction. One ounce of the bark to a quart of water, boiled down one-third, may be taken in doses of a gill, repeated five or six times in twenty-four hours. The powdered bark may be given in doses of from twenty to thirty grains.

For an excellent figure and description of this shrub, the reader is referred to Bigelow's Medical Botany, vol. iii.

SAPONARIA OFFICINALIS.

This plant is common to France, Germany and England, and is now naturalized and abundant in the United States. It has a long, creeping, articulated and knotty root, of a reddish-brown color externally, and white within. The stem is erect, branched, jointed, and from five to eighteen inches high. The calices are cylindric, and the flowers white. It grows among rubbish along road-sides, and near neglected out-houses. It flowers in July. The whole plant has a bitterish and slightly acrid taste. The infusion of the leaves assumes a pale black color on adding to it some sulphate of iron; the decoction of the root, however, undergoes no change by the addition of this salt. A saponaceous substance may be obtained from the decoction of the recent leaves, which appears to contain all the active properties of the plant. Alcohol extracts an acrid and penetrating substance.†

The soapwort has been highly recommended for its medicinal powers. Alibert, whose opinion merits great deference, observes that it is surprising that this plant is not more frequently employed; its energetic properties entitling it to a distinguished rank in the

* Amer. Med. Botany, vol. iii.

† Alibert, Elémens de Thérap., vol. ii. p. 333.

materia medica. In rheumatic affections depending on a syphilitic taint, and in arthritic pains, it is stated to be an exceedingly useful remedy. "It often happens," says Alibert, "that venereal affections resist the powers of mercury; the symptoms increasing instead of diminishing under its influence. In such cases the saponaria produces excellent effects. I have very frequently administered this remedy in scaly tetters, (dartres furfuracens,) and I have had occasion, in a great variety of instances, to be satisfied that this valuable plant is too much neglected by practitioners."* I once saw a case of herpetic eruption entirely cured by the use of this article, after it had resisted almost every other treatment recommended in such cases. It is also said to be very serviceable in scrofulous and other ill-conditioned ulcers; particularly in venereal ulcerations of the throat and mouth.†

The saponaria is usually given in decoction; and the root is said to be much better for this purpose than the plant. The decoction may be made by boiling two ounces of the root in two quarts of water down to one quart; the whole of which is to be taken in twenty-four hours.

SULPHUR.

I HAVE already given an account of the medicinal powers of this substance, in the chapter on Cathartics, and need, therefore, in this place, do little more than to notice more particularly its tendency to act upon the cutaneous system. Sulphur has been long celebrated, both as an internal and an external remedy in the cure of chronic cutaneous diseases. It has also been highly recommended in rheumatic and gouty affections, and in diseases of the lymphatic system.‡ Not to repeat, however, what I have said upon this subject,§ it will be here necessary only to add something concerning the effects of this remedy when applied externally in the form of fumes. Sulphurous fumigations have been highly extolled, within a few years past, in the treatment of a great variety of obstinate complaints. Dr. Gales, of Paris, was the first who introduced this method of applying sulphur. The apparatus which he used for this purpose, consisted of a wooden case, having an aperture in the upper part. The fumes arising from ignited sulphur, are applied to the naked body of the patient seated in the box, with his head out of the aperture at

* Alibert, Elémens de Thérap., vol. ii. p. 332.

† Burdach, Arznei., B. iii. p. 150.

‡ Alibert, Sœmmering. De morbis vasorum absorbentium, &c.

§ Vide pp. 132-3.

the top. Around the edge of this opening, a leather bag is fixed, which, being fastened around the neck, prevents the fumes of the sulphur from reaching the eyes, nose, or mouth.

The immediate effects experienced from fumigation, is a sense of prickling heat in the skin, which is soon followed by profuse perspiration. The diseases in which sulphurous fumigation has been found most beneficial, are chronic rheumatism, psora, lepra and herpes. Dr. Gales relates many cases of this kind, in which the good effects of this treatment were surprisingly prompt. Dr. De Carro, of Vienna, who introduced the sulphurous fumigating baths into Germany, has also published the results of his experience with this remedy; and we are informed that, in the majority of the cases, "the benefit derived was very striking, and the shortness of the period necessary for the cure, really astonishing." Alibert observes that the *pustular* and *papular* itch are not equally benefited by sulphurous fumigation. The former variety is almost always exasperated by the contact of sulphurous vapors, whilst a liquid application, composed of a certain proportion of sulphur of potass and sulphuric acid, readily cures it. This is also the case in long-standing and cachectic cases, attended with brown crusts of different sizes, scattered over the arms and thighs. Frictions with sulphur ointment, alternated with simple baths, are generally sufficient to remove this variety of the disease; whilst fumigations are often followed by no evident advantage. The papular itch, however, may be treated with peculiar advantage by fumigation.*

It appears from the observations of MM. Alibert and Biett, that many persons are wholly incapable of supporting the influence of sulphurous fumigations. It sometimes produces alarming syncope, and a sense of suffocation. Alibert points out the following counter-indications to the employment of the sulphurous vapor-baths. 1. A predisposition to apoplexy. 2. Asthma and chronic catarrhal affections in old people, and a predisposition to phthisis. 3. Organic affections of the heart. 4. Pregnancy.

That sulphur applied in the form of fumes will often act very beneficially in cutaneous affections, cannot be doubted. It would appear, however, from later experience, that its powers were, at first, considerably exaggerated, and that its good effects are pretty much confined to those cases in which sulphur, applied in the form of ointment, or the application of diluted sulphuric acid, has been found serviceable. It possesses, however, the advantage of acting much more promptly, and of exciting profuse perspiration, which latter circumstance will sometimes enable it to afford relief in rheumatic and other affections connected with torpor of the perspiratory function.

* Alibert, Elémens de Thérap., tom. ii. p. 144.

CHAPTER XIII.

EPISPASTICS.

The term epispastic was anciently applied to all such articles as produce redness, inflammation, or vesication, when placed in contact with the cuticular surface. At present, however, it is used in a more limited sense; being restricted to those substances alone which excite the exhalants to an abundant effusion of serum under the cuticle, producing vesication, or, in common language, blisters. The modus operandi of vesicatories in the cure of diseases has been a subject of much controversy. Much of their beneficial operation was formerly ascribed to the evacuation they produce. That they do some good in this way, though not so much as has been supposed, I cannot doubt. I suspect, however, that more advantage is derived from the secondary or purulent discharge than from the serous, or that which is the immediate consequence of vesication. To be convinced of the effects of discharges of this kind, we need only advert to the manifest influence which the occurrence of abscesses, or the production of artificial eruptions occasionally produces on diseases. The suppression of a small discharge from behind the ears of children, is often followed by the most dangerous consequences, and its reestablishment is as generally manifestly beneficial. It is frequently observed, too, that the good effects of blisters do not occur until the secretion of pus commences. It is, after all, highly probable that the discharge from a vesicated surface is in the majority of cases salutary, more by its secondary effects in keeping up a new determination to the part, than by its direct influence as an evacuation. When we advert to the nature of those diseases in which blisters are most beneficial, it appears evident, I think, that their salutary operation must depend mainly on diverting the circulation and excitement from the affected organs, and directing them upon the vesicated part. Thus blisters applied to the side in peripneumony establish an increased determination to the surface, and by this effect produce a derivation from the inflamed vessels of the pleura and lungs, and enable them to recover their healthy state. A blistered surface may be considered in the light of a new excretory organ, the

formation of which requires the establishment of a new current or determination of blood. So long as the discharge continues, so long will there be an especial demand of blood in the blistered part, and a consequent derivation of the circulation from the inflamed and engorged vessels of the neighboring organs. It is by thus rendering a constant supply of blood necessary in blistered parts, and thereby sustaining the local determination to the surface, and not by evacuating any morbific matter, that the discharge from blisters, for the most part, appears to do good. It is nevertheless quite probable that blisters do sometimes act beneficially by their direct depletory effects. In erysipelas, for instance, we often derive immediate and decided benefit from blistering the affected part. To explain this, as is commonly done, by ascribing it to the establishment of a new action in the part, appears to me exceedingly vague and unsatisfactory. Is not the direct evacuation of serum from the inflamed vessels sufficient to explain the advantages obtained in cases of this kind from blistering? In erysipelas the cutaneous capillaries are especially involved in inflammation. Why, therefore, should we not expect benefit from an application which is calculated in a direct way to lessen the contents of these engorged capillaries?

Blisters have also been supposed to do good by their stimulating and cordial effects. "That these remedies," says Dr. Chapman, "are cordial and exhilarating, is proved by their efficacy in all nervous affections, whether distinguished by a preponderance of mental or corporeal infirmity and weakness." It appears to be well ascertained, however, that in all cases of *real* debility, vesicating applications can prove serviceable only when employed in such a way as simply to produce a rubefacient effect; blistering under such circumstances being almost invariably detrimental. In nervous affections, attended with weakness, blistering is, without doubt, often beneficial. But it must not be inferred, that the good effects of blisters in such cases are in any particular degree dependent on their "cordial or exhilarating" operation. For it is to be observed, that the weakness which attends nervous affections, is frequently immediately dependent on irregular determinations to some of the internal organs, and that in proportion as we obviate such determinations or congestions, and thereby relieve some oppressed vital organ, so do we remove the weakness to which they give rise. It is by an operation of this kind chiefly, I conceive, that vesication is found occasionally to produce invigorating consequences in nervous affections.

Cullen ascribes the beneficial operation of blisters to their supposed power of relieving spasm. That the skin frequently becomes moist and relaxed from vesication, is certain; but it is very questionable whether this can be properly ascribed to the direct

antispasmodic or relaxing powers of such applications. By relieving pain, irritation, and congestions of the internal organs, blisters may give a general healthy impulse to the various emunctories of the system, and enable the cutaneous capillaries to resume their regular action. The utility of blisters in some of the spasmodic affections, would seem to countenance the idea of their possessing antispasmodic powers. Their effects in this way, however, must be referred to the same operation that has been mentioned in relation to their employment in nervous affections.

In whatever manner we may account for the operation of blisters, experience has fully demonstrated their utility in a great variety of affections. In the treatment of febrile diseases, they are capable of affording very important advantages. Physicians have, however, by no means been unanimous in recommending them in fevers. Dr. Fordyce rejected them as not only useless, but even pernicious. The authority of this eminent physician, has, however, not been sufficient to countervail the testimony which the experience of the majority of the profession has brought forward in favor of the beneficial effects of blistering in fevers. In the treatment of intermittents, blisters cannot be considered as an ordinary remedy. Under certain circumstances of the disease, however, they may occasionally be employed with great advantage. Cases occur which are attended with an irritated pulse and a dry skin during the intermission, and which are found to resist the most liberal use of bark, &c. In such cases, the application of blisters to the wrist or ankles, or a large one laid between the shoulders, will generally produce such a change in the character of the disease, as to enable the bark fully to display its febrifuge powers.

In continued fevers, blisters judiciously managed are undoubtedly often of great advantage. But it must be admitted, that unless they are well timed as to the period of the diseases, they are not only useless, but frequently manifestly injurious. As a general rule, blisters are inadmissible in the commencement of febrile affections. Where inflammation or dangerous congestion of some important internal organ is present, they are, nevertheless, sometimes of essential service, and may be resorted to in the very beginning of the disease, concomitantly with venesection and other antiphlogistic measures. But in idiopathic fever, without any evident congestion or inflammation, they seldom fail to do harm when employed before the alimentary canal has been duly evacuated, and the action of the heart and arteries moderated by proper depletory measures. There is a period in the course of continued fevers, intermediate between the stage of high excitement, and the appearance of symptoms of collapse, in which blisters will generally produce unequivocal good effects. This is

what has been called the blistering point, an expression familiar to those who are acquainted with the writings of Rush. Those who have contemplated fevers most attentively have noticed, that they often begin to decline immediately after the occurrence of some particular spontaneous evacuation, or on the appearance of abscesses, &c. It is also ascertained that such "critical movements" seldom, if ever, occur during the primary stage of febrile excitement. It appears, therefore, that there is a tendency in fevers, at a certain period of their course, to throw a more than usual burden upon some of the emunctories, or to establish particular determinations, giving rise to hemorrhage, abscesses, &c., as the first movement towards amendment. It is at this period in the course of febrile diseases, during which efforts of this kind are sometimes observed to occur, that blisters appear to be particularly serviceable. It is only, however, when the indications of a change of action in the system are obscure or imperceptible that vesicatories are admissible; for during what is commonly denominated a critical discharge, they would be obviously improper. The utility of blisters in continued fever, unattended by any particular local affection, appears to me, therefore, to depend on giving an impulse to the sanative powers of the living economy, and at the same time establishing a new secreting surface, towards which the humors are especially directed. In cases attended with symptoms of particular affection of any of the important internal viscera, we employ blisters upon a different principle. In instances of this kind our object is to relieve the oppressed organ, and we accordingly apply the blister as near the affected viscus as is practicable, in order more effectually to derive the blood from the engorged or inflamed vessels. Thus, in fevers attended with delirium, and other symptoms of inflammation and engorgement of the vessels of the brain, blisters are applied to the head, not so much with a view of arresting the progress of the general disease, as of relieving and protecting this important organ. Percival observes, that in fevers attended with a general disposition to inflammation, without any one part suffering more than another, blisters always act injuriously. When, however, local inflammation of any of the internal organs is connected with the fever, vesication is almost universally useful. Experience, he says, demonstrates, that in such cases blistering the skin near the affected part lessens the flow of blood to it, and thus contributes to resolve the inflammation, and consequently the general febrile excitement.*

Blisters are very important remedies in the treatment of the different varieties of phlegmasial diseases. In acute pulmonic

* Essays, Medical, Physiological and Experimental.

affections especially, they are often indispensable. Some difference of opinion exists among physicians as to the proper time for applying blisters in pneumonia. It is contended by some that they do more mischief than good when resorted to before the action of the heart and arteries has been considerably reduced, while others allege that they may be advantageously applied in the very commencement of the disease. That blisters may be very early resorted to in pneumonia with advantage, I am entirely persuaded from repeated experience. Without doubt, however, they will perhaps always act with more decided benefit when applied after the vehement arterial excitement has been somewhat moderated by depletory measures. But they may nevertheless, generally, be resorted to very early with advantage; and more especially, as several bleedings may be practised between the time of their application and the commencement of vesication, and the general momentum of the circulation be thus diminished, before the stimulus of the epispastic has had time to disturb the system. In relation to this point, Dr. Armstrong makes the following observations: "It has sometimes struck me very forcibly," says he, "that the precipitate application of blisters to the chest, before general or local blood-letting, is a prejudicial practice: at least I have occasionally seen hydrothorax rapidly follow it, from the increase of the general and topical excitement which blisters thus applied had apparently produced. This point therefore, is, perhaps, deserving of further investigation in the acute pulmonary inflammation."* In pleurisy and other acute pulmonic affections, the blisters should be laid immediately over the part which appears to be principally affected. Some very celebrated writers, however, recommend them to be applied on the thighs or legs. Baglivi observes, that cases of pleurisy sometimes occur in which great difficulty of respiration and suppression of expectoration come on about the fifth or sixth day, whether bleeding has or has not been practised. "Two blisters applied to the legs and thighs in such cases, will not only promote the expectoration, but remove the difficulty of breathing, and produce a favorable change."† This practice, as Alibert observes, is sanctioned by the following aphorism of Hippocrates: "In pulmonis affectibus, quicunque tumores fiunt ad crura, boni; nec potest quidquam melius accidere si mutato sputo, sic appareant."

In the treatment of hepatitis, both chronic and acute, blisters are often highly serviceable; and in inflammation of the bowels and peritoneum they are indispensable. In all these affections the blisters should be large and applied immediately over the

* Practical Illustrations on the Scarlet Fever, p. 154.

† Alibert, Elém. de Thérap.

affected parts. In acute hydrocephalus, also, blisters over the scalp, or what is better, on the back of the neck, can never be neglected with propriety. In all these affections, however, it is necessary to observe that bleeding forms the primary and most essential curative measure. In acute rheumatism, after the violence of the general excitement has been considerably reduced, blisters will commonly procure great relief when laid over the parts particularly affected. They are also useful in some varieties of the chronic form of this complaint, and particularly in sciatica. "In the worst chronic states of local rheumatism of the nerves," says Dr. Scudamore, "I have seen the cure obtained, or very material relief afforded, by the successive application of blisters."* In the cure of gout, blisters have been recommended by some writers and condemned by others. Rush and Musgrave speak favorably of their employment both in acute and chronic gout; whilst Cullen and Scudamore consider them as at least hazardous.

It is unnecessary, however, to mention particularly every variety of phlegmasial disease in which blisters may be employed with advantage. With the exception, perhaps, of nephritis, they may be considered as primary remedies in all internal inflammatory affections. In nephritis, however, they are inapplicable on account of the tendency which cantharides possess of irritating the urinary organs, and consequently of increasing the inflammation of the affected parts. We need only advert to the modus operandi of blisters in the cure of internal inflammatory affections, as explained in the beginning of this chapter, to see their general applicability in the various forms of these complaints. For it is obvious that every remedial measure which has a tendency to divert, in any degree, the circulation from the affected parts, and direct it upon external and less important ones, must be capable of procuring beneficial effects in this class of diseases.

In the treatment of dysentery, and especially of cholera, blisters may often be applied both to the extremities and the abdomen with great advantage. In the latter of these affections, blistering with cantharides is much too slow for the very rapid course of the disease. The nitric acid has, however, been recently employed for this purpose with the happiest effect, being exceedingly prompt and active as a vesicatory. In cholera infantum, blisters, or at least rubefacients, are of essential utility. Applied over the region of the stomach, they often allay the inordinate irritability of this organ in a very effectual manner.

In severe cases of dyspepsia, attended with inflammatory irritation of the mucous membrane of the stomach, blisters, laid over the epigastric region, generally procure important relief.

* Treatise on Gout and Rheumatism, p. 316.

Blisters have also been frequently resorted to, in the exanthemata, and particularly in confluent small-pox, and in measles, when the eruption recedes suddenly, or symptoms of pulmonic inflammation and oppression supervene. But in subjects who have been much worn down by these diseases, and in whom the existence of obscure visceral inflammation may render epispastics necessary, blisters must be applied with great caution. For the blistered portion of the skin, in cases of this kind, is apt to become gangrenous producing dangerous and obstinate ulcerations. "The skin is one of the principal seats of the measles. It is exceedingly stimulated during the eruptive fever, and suffers a correspondent loss of tone as that fever declines; and as this cutaneous debility is greatest in emaciated, or in broken up habits, so the surface in them is less able to resist inflammation, without ending in gangrene or in an ill-conditioned sore."*

In the treatment of erysipelas, blisters have been recommended as very efficacious. They are to be applied immediately on the inflamed part, and suffered to lie until vesication is produced. To arrest the progress of gangrene, blisters are among our most valuable remedies. Cotunnius states that he once saw the lower extremities of a patient laboring under putrid fever, become gangrenous; and that the gangrene extended to every part of the legs except to those upon which the blisters had been laid. The mortification terminated about a finger's breadth from the margin of the blisters.† Blisters, observes Rœmer, appear, therefore, to possess the power to arrest the progress of mortification.‡ It is to Dr. Physick, however, that we owe our knowledge of the real value of this remedy in gangrene. The blister should be large enough to cover all the sound parts in contact with those which are in a state of gangrene. "I have witnessed the effects of blistering," says Dr. Dorsey, "in a variety of instances, and have no hesitation in recommending them in preference to all other local remedies. After the first dressing of the blister, it will generally be found that the mortification has ceased to progress, and in a short time the separation of the sloughs commences."§

Blisters have also been employed with much benefit in some varieties of hemorrhage. They are especially useful in epistaxis; an alarming case of which I once saw effectually arrested by a blister laid on the back of the neck. Dr. Robert Archer, of Norfolk, has related a remarkable instance of the utility of blisters in a case of this kind. The patient was nearly exhausted; every

* Practical Illustrations on the Scarlet Fever, Measles, &c., p. 172.

† De Sedibus Variolarum.

‡ Rœmer's Chirurgische Arzneimittellehre, tom. i. p. 218.

§ Elements of Surgery.

means that could be suggested had been tried in vain. On the fifth day a blister was applied to the back of the neck. This application "produced an astonishing effect, for it no sooner began to vesicate than the hemorrhage ceased as if by a charm." The patient recovered rapidly; but as soon as the blister healed, the bleeding returned. The blisters was renewed and kept open for some time; the hemorrhage immediately ceased, and the patient recovered his health.* In hydropic affections, blisters are sometimes highly beneficial. They are particularly useful in ascites and hydrothorax, unattended with much anasarcous effusion. They tend, very considerably, to derive the blood from the irritated or congested serous membranes, from which the effusion occurs, and consequently to lessen the effusion and promote its absorption. In anasarca, blisters cannot be applied without more or less risk of gangrene or mortification.

In the treatment of spasmodic affections, blisters have been observed to display very considerable powers. Several cases are related of their successful application in tetanus. Dr. William Carter, of Canterbury, gives an account of a case of this disease from a wound, in which he applied a blister between the shoulders the whole length of the spine, and directed an active purge every two or three days, giving, on the intermediate days, oil of amber and assafetida. By these means the patient recovered his health in less than three weeks.† In the cure of epilepsy, blisters have been more frequently employed than, perhaps, in any other of the spasmodic diseases. Mead,‡ Baumes and Percival mention cases of the successful application of blisters in this disease. Richter observes, that vesicatories are most applicable in such cases as are attended with an irritated condition of the brain during the intervals, and connected with a dull and soporose disposition, and a small and trembling pulse.§ Blisters are said to act most beneficially in this disease when laid on the calves of the legs. Riverius‖ and Piso cured inveterate cases of epilepsy by applying them to the scalp and keeping them open for a considerable time. That cases of epilepsy have been cured by this remedy, we are not permitted to doubt. It does not appear, however, from the aggregate experience of the profession on this head, that they are entitled to any particular confidence in this intractable complaint.

* American Medical Recorder, vol. i. p. 16.

† Medical Transactions of the Lond. College of Physicians, vol. ii. p. 341 : 772.

‡ De Imperio Solis et Lunæ, etc., cap. ii. p. 8.

§ Richter's Specielle Therapie, vol. vii. p. 710.

‖ Opera, lib. i. sect. 2, cap. vi.

In a great variety of local complaints vesicatories are of essential service. In inflammations of the joints, both acute and chronic, they are highly useful. They should be laid immediately over the affected joints, and kept discharging for a long time. This remedy, together with rest and a general antiphlogistic regimen, will frequently produce the happiest effect.

The application of a blister to the tract of an inflamed vein is a practice of much value. This treatment was first introduced by Dr. Physick. "A small plaster of simple cerate, spread on linen, is to be applied to the orifice, and over this a blister laid large enough to cover the whole inflamed part, extending three or four inches from the orifice in every direction."*

In incontinence of urine, depending on a paralysis of the sphincter of the bladder, blisters laid on the sacrum have been employed with much advantage.† Oliphant relates two instances of this kind, one of which was in a man of seventy-two years of age, in which the application of a blister over the os sacrum gave perfect relief.‡

Blisters have also been found very serviceable in some of the chronic cutaneous diseases. Bloch§ and Richter‖ employed them with great success in herpetic eruptions; and Ambrose Paré relates a remarkable case of an eruption in the face cured by this remedy. The patient was a lady of distinction; her face was covered with innumerable little ulcers, and considerably swollen. The physicians considered it as a case of elephantiasis. After employing a vast variety of remedies without the least advantage, they applied blisters over the affected parts. These had hardly lain an hour before she experienced violent pain in the bladder, which was soon followed by tormina, vomiting and fever. The blister drew well, and the disease disappeared, and never afterwards returned.¶ For obviating or removing the injurious consequences which sometimes result from the sudden retrocession of cutaneous eruptions, blisters are among our most efficient means.

LYTTA VESICATORIA.—CANTHARIDES.

The cantharides are a beautiful and well-known insect of the beetle tribe, being exceedingly abundant in the southern parts of

* Dorsey's Surgery.
† Lond. Med. Observat., vol. i. p. 318.
‡ Gesner's Endeckungen, B. iii. p. 725.
§ Schmucker's Chirurg. Schriften, vol. ii. p. 96.
‖ Richter's Medical Library, vol. iii. p. 289.
¶ Opera, lib. xx. cap. 27.

Europe, and particularly in Spain. They delight to dwell on the leaves and flowers of the ash, the black poplar, the elder, and lilac, from which they are collected in June and July, and afterwards destroyed with the fumes of strong vinegar, and dried in the sun.*

These insects have a peculiar sweetish and nauseous odor. When first taken in the mouth they have very little taste, but on being chewed they become considerably burning and acrid. Hippocrates directs the heads, wings and feet to be thrown away, as being, according to his notion, particularly poisonous. Galen, Pliny and Ettmuller, on the contrary, thought that the bodies were the most poisonous, and that the heads, wings and feet possess the power of counteracting the poisonous effects of the bodies. Cantharides have frequently been the subject of chemical analysis. According to Mr. Robiquet, they contain: 1. A blistering principle, to which Dr. Thomson has given the name of *cantharidin.* 2. A green concrete oil. 3. A yellow fluid oil. 4. A peculiar black substance, soluble in water and proof spirits, but not in pure alcohol. 5. A saponaceous or yellow substance, soluble both in water and alcohol. 6. Uric acid. 7. Acetic acid. 8. Phosphate of magnesia. 9. A parenchymatous substance.† The blistering principle, or cantharidin, when obtained in a separate state, consists of small plates of a micaceous lustre. It is insoluble in cold alcohol and in water. Boiling alcohol, however, dissolves it, but precipitates it again on becoming cool. Ether and the oils dissolve it readily. Although not soluble in water, it is rendered so by the presence of the yellow or saponaceous substance with which it naturally exists in a state of combination. The blistering property is very highly concentrated in the cantharidin. An atom of it dissolved in sweet oil, and applied to the skin with a bit of paper, produces vesication in five or six hours.‡ Neither the black substance nor the green oil possesses vesicating powers.

Cantharides have a peculiar tendency, whether taken internally, or applied as a vesicatory to the skin, to act upon the urinary

* This mode of destroying cantharides is of very ancient date. Dioscorides recommends it particularly.

† Annal. de Chimie, tom. lxxvi.

‡ The cantharidin may be obtained by the following process: Boil the cantharides in water repeatedly, until all the soluble parts are extracted; filter the decoction, and evaporate it to the consistence of an extract. Digest this extract in concentrated alcohol, then pour off the alcohol, and evaporate it; sulphuric ether, added to this alcoholic extract, will take up the cantharidin, which may be obtained in a pretty pure state by evaporation.—*Pfaff's Mat. Med.*, vol. iii. p. 243.

organs, and especially to produce irritation and inflammation of the neck of the bladder, and consequently strangury. It has been much disputed whether strangury be produced by the absorption of the acrid portion of the cantharides, or whether it be merely the result of a sympathetic impression conveyed to the bladder. That strangury proceeds from the absorption of the acrid principle of the cantharides, is extremely probable from the fact that no other vesicating substance produces this effect. It is, moreover, very unlikely that the bladder should possess so extensive a sympathy with the surface of the body, as it must do if strangury from blistering be the result of a sympathetic impression; for, on whatever part of the body blisters be laid, strangury may be the result. Dr. Chapman observes, that "if strangury do thus arise, it ought invariably to take place on the application of a blister," which, however, is an incident of rare occurrence. But wherefore should strangury more frequently follow blistering, if it be occasioned by absorption of the cantharides, than if it depend on a sympathy between the skin and bladder? We might with just as much, and more plausibility say, that if strangury arise from a sympathetic connection between the external surface and the bladder, it ought more constantly to follow blistering. We know that turpentine occasionally produces strangury when taken internally, and that it is absorbed, and conveyed out of the system by the urinary organs. But are we to deny the absorption of this substance because it does not *always* produce strangury? The fact of its absorption is unquestionable. Dr. Chapman also states, "it is known that the internal use of cantharides is seldom attended by any effect, and when it does occur, it is more frequently from small than large doses of this article." Against the correctness of this statement I may, with confidence, appeal to the general experience of the profession. By *large* doses of this article strangury may be generally induced, whereas small doses seldom produce any sensible effect whatever. Nor is it a fact that the internal use of cantharides is *seldom* attended by this affection of the bladder. In a highly interesting paper published by Dr. J. Klapp, on the emmenagogue powers of cantharides, nineteen cases are detailed in which this remedy was administered internally, and in eight of which symptoms of strangury supervened.*

Blisters are particularly apt to excite strangury when applied to the head immediately after the scalp has been shaved; and more especially if the skin be wounded. This may be attributed to the greater facility which the absorbents possess of taking up the active principle of the fly, when the cuticle has been abraded

* American Medical Recorder, vol. ii. p. 37.

and wounded by shaving; and hence, when cantharides are applied from twelve to twenty-four hours after the head is shaved, this effect hardly ever ensues.* To obviate, or relieve strangury, much benefit may be derived from the free use of mucilaginous and mild diuretic drinks, as barley-water, infusions of flaxseed, parsley, melon-seed, and particularly of marshmallows, or of our common round-leaved mallows (malva rotundifolia). In addition to these, opium, taken into the stomach, or administered in the form of a clyster, is always of essential service. Much benefit is also to be derived from warm bathing, or from fomentations to the perineum and pubis. Formerly camphor was a good deal recommended as a remedy for strangury; and it does not appear to me to be wholly inefficacious in this respect. When speaking of this article under the head of narcotics, I adverted to its evident tendency to diminish venereal sensibility, or perhaps, more properly speaking, to lessen the activity of the genital organs. This effect of camphor would seem to depend on an operation directly the reverse of that of cantharides,—namely, a diminution of the flow of blood to those parts. But as the operation of camphor in this respect is slow, it can seldom be employed with any particular advantage in cases of this kind, which require much more prompt means of relief. After the violence of the symptoms is over, and some pain or irritation remains at the neck of the bladder, it will nevertheless often prove useful, as I have in several instances witnessed.

Cantharides seldom produce complete vesication under ten or twelve hours. Before applying a blister, the skin upon which it is to be laid, or the surface of the plaster should be moistened with vinegar or brandy. When the blister is drawn, it must be opened and dressed with simple cerate spread on linen. To keep up the discharge from a blistered surface, an ointment made of a small portion of cantharides and lard, is one of the best applications. Savin ointment is also very good for this purpose. When a blister is in a state of painful irritation, sweet oil, lard, or a soft bread and milk poultice should be applied.

Complete vesication may be produced by removing the cantharides as soon as the skin is slightly reddened or inflamed, and applying an emollient poultice over the part. This is a good mode of blistering in infants, or where we wish to avoid much pain and irritation. We may also vesicate in this way, in anasarca or œdema, with little or no risk of producing gangrene or sloughing.

* Percival's Medical Essays, vol. i.

LYTTA VITTATA.—POTATO FLY.

This insect is said to belong exclusively to the United States. It feeds chiefly on the potato plant, upon which it is often found in immense numbers about the end of July or beginning of August. It resembles in outward form the cantharides; being, however, somewhat smaller, and of a different color. Its head is red, with black antennæ; the wing-cases are black, with a pale yellow margin, and a stripe of the same color along the middle of them; the tarsi have five joints. "The abdomen of this insect is a hard, white substance, about the size of a grain of wheat, which, when powdered, appears like meal, and when rubbed with water forms a milky emulsion." Dr. Isaac Chapman, of Bucks county, in this state, was the first who publicly noticed the vesicating properties of this species of Lytta.* According to his experience, it is equal, if not superior, in this respect, to the cantharides; and this has been confirmed by the experience of other practitioners. The late Professor Barton gave a decided preference to the American fly. "Long-keeping," he observes, "provided it be carefully kept, does not materially impair the blistering property of the lytta vittata. At the end of three or four years after being collected, I have found it equal in power to the best shop cantharides." Dr. Gorham, of Boston, states that, in an extensive series of experiments with this fly, he found it equal, if not superior, in every respect, to the cantharides. Administered internally, it produces the same effects upon the urinary organs, and is applicable to the same medicinal purposes as the Spanish fly.

There are other native species of this genus of flies which possess valuable vesicating properties. The lytta attrata is a very common insect in this country. In the autumn it is found in great abundance on some of the syngenesious plants, such as aster, soledogo, &c. "Though inferior," says Dr. Barton, "to the lytta vittata, it is well worthy of the attention of physicians." The lytta marginata is not so common, but is an exceedingly powerful vesicatory. The lytta cinerea is said to be no less powerful than the latter species; it is, however, very scarce.

I may also in this place mention the meleo niger, which was first noticed as a vesicatory by the late Professor Woodhouse. According to his experiments with this fly, it seems to possess very active vesicating properties. It is about half the size of the potato fly, and dwells particularly on the ambrosia trifida.

* Medical Repository, vol. ii.

NITRIC ACID.

The nitric acid has been recently introduced into practice as a very valuable vesicating application in certain rapid and dangerous affections. Dr. Kennedy has published an interesting paper on this subject in the Edinburgh Medical and Surgical Journal. It has been found particularly efficacious in cholera of India, a disease so rapid in its progress and fatal in its consequences, that nothing but extensive blistering of the epigastric region appears to be capable of arresting its course. Blistering with nitrous acid, being exceedingly prompt, and attended with much local irritation, is, according to the experience of Mr. Powell, surgeon at Bombay, a remedy of great powers in this affection. "The good effects," says Dr. Kennedy, "of this sudden and powerful counter-irritation, were strikingly illustrated in the case of an European, who received immediate relief in the burning sensation at the stomach on the acid blister being applied; and who, the next morning, being annoyed with spasms of the extremities, requested the same remedies might be applied; it was accordingly done, and so great was the relief obtained to one leg, that he cried out for God's sake to apply it to the other, which was similarly affected." Another patient, he observes, was brought in, and supposed to be past recovery. His stools passed off involuntarily; the extremities were cold, and the pulse could not be felt. "The acid blister was applied to the stomach, and the patient got well." Two parts of the acid are to be diluted with one part of water; with this mixture the surface over the affected part is to be rubbed. As soon as the patient experiences pain from it, the acid is to be neutralized by washing the surface with a solution of carbonate of potash. "The cuticle can now be easily detached, and leaves the cutis very raw, upon which a common blister may be laid to keep up the irritation."*

TARTARIZED ANTIMONY.

Although not a vesicating substance, tartar emetic deserves to be particularly mentioned in this place, as possessing the power of exciting a peculiar pustular eruption, frequently followed by highly salutary consequences. The best mode of using it for this purpose is to incorporate it with simple cerate or lard, in the pro-

* Observations on the Use of Nitrous Acid as a Substitute for Blisters, by Dr. Kennedy, F. R. S. E., in the Edinburgh Medical and Surgical Journal for Oct. 1820.

portion of a drachm of the former to about an ounce of the latter, and to apply it either by frictions, or spread on leather, and worn in the way of a plaster on the skin. Dr. Jenner, who has recently published a most valuable essay on the influence of artificial eruptions on certain diseases,* recommends the tartar emetic ointment to be made according to the formula given below.† The effects which arise from inunction with this ointment are, a sense of itching or prickling in the part rubbed, commonly appearing on the second or third day after the frictions have been commenced. "If the part so affected be rubbed, or in any degree irritated, (from which few can refrain at first,) an eruption of small watery pustules takes place immediately." If the patient abstain from irritating the part, the eruption will appear somewhat later. "The pustules," says Dr. Bradley, "are uniformly compared by patients to variolous pustules; but they are much smaller, not so red at the base, nor so tense and white when fully suppurated." I have, however, seen them much larger than the variolous pustules, and they are generally very painful.

In the essay already quoted, Dr. Jenner adduces a number of cases in which this ointment was applied with the happiest effects. He employed it with success in mania, phthisis, asthma, chronic hepatitis, chorea, epilepsy, and various other anomalous cases. This application has also been highly recommended as a remedy in hooping-cough. "Of all the remedies," says Dr. Robinson, "I have found beneficial in hooping-cough, frictions upon the region of the stomach with the tartarized antimonial ointment have been the most remarkably and most undeviatingly useful. The eruption on the stomach is frequently accompanied with a slight degree of inflammation about the remote parts in females, with a spare eruption of minute pimples, and, on this occurring, the disease uniformly begins to abate. In cases where the patient is of a full habit, and the inflammatory diathesis runs high, it may be proper to apply a few leeches to the feet previously to the use of the antimonial ointment. But I have used it with advantage, even in cases where the fever was attended with delirium at night. I have never seen the eruption produced in this way threaten the bad consequences from gangrene which not unfrequently supervene when the blisters are applied too early in hooping-cough, when the inflammatory diathesis runs high, and before blood has been abstracted. The effects of the ointment in other respects are also widely different. When it does produce an eruption, it al-

* American Medical Recorder, vol. v. p. 684.

† Antim. tart. (subtil. pulv.) ʒii; ung. cetacei ʒix; sacch. albi ʒi;* hydr. sulph. rub. gr. v.—M. fiat unguent.

* The sugar prevents the ointment from becoming rancid.

most always affords relief; whereas I have never seen an instance where the application of a blister has been of the smallest service in hooping-cough, except after blood-letting, when there have been manifest symptoms of inflammation."* This accords with the experience of Dr. Jenner: "With tartarized antimony," observes that distinguished physician, "we can not only create vesicles, but we can do more—we have at our command an application which will at the same time both vesicate and produce diseased action on the skin itself, by deeply deranging its structure beneath the surface. This is probably one cause why the sympathetic affection excited by the use of cantharides, and those changes produced by tartar emetic, are very different."

The eruption should be kept up for some time, either by the re-application of small portions of the diluted tartar emetic ointment to the affected part, or by other gently stimulating ointments. If they become much irritated and very painful, a soft bread and milk poultice, or an ointment made with equal parts of sweet oil and wax, will in general afford relief, without interfering with the eruption.

"The activity of tartar emetic ointment is, to a considerable extent, proportional to the fineness of the powder of the tartar emetic; and as it is frequently carelessly prepared with the tartar emetic as found in the shops, we need not be surprised, that in many instances it disappoints the expectations of the practitioner. The reduction of the salt to a proper degree of minuteness requiring some time and labor, M. Mialhe recommends that a saturated solution of it in cold water be made, and that it then be precipitated with alcohol. The precipitate is to be collected on a filter and dried. Two drachms of this powder mixed with an ounce of simple cerate, will make a very active ointment. A very small quantity of alcohol will suffice to precipitate the tartar emetic in the form of an impalpable powder."

SETONS AND ISSUES.

The effects of setons and issues are very analogous to those of the articles already mentioned in this chapter. Being, however, very permanent in their operation, they are often peculiarly applicable in certain chronic affections where it is necessary to keep up a long-continued counter-irritating influence. Among the Greek and Roman physicians, caustic issues were frequently resorted to. Hippocrates employed them in gout, sciatica, chronic diseases of the liver, spleen and lungs; and Ætius mentions their

* London Medical Repository, January 1821.

use in palsy and asthma. Celsus, also, employed them in affections of the joints, in epilepsy and in phthisis. Boerhaave and De Haen, in modern times, recommended them in the treatment of the scrofulous disease of the hip joint; and Mr. Pott speaks highly of their efficacy in diseased or incurvated spine. A caustic issue on each side of the diseased vertebræ has been frequently known to give perfect relief in such affections. Dr. Rogers, Professor of Natural Philosophy and Chemistry at Williamsburg, Virginia, has recently published some highly interesting observations on the employment of caustic issues. He relates several cases of phthisis pulmonalis, which yielded entirely to their influence. In a case of this kind, which, from the strong hectic symptoms, the constrained state of the respiration, and the appearance of the matter expectorated, was considered altogether hopeless, a caustic issue formed on the sternum inter mammas, performed a perfect cure in the space of about three months. "In chronic affections of the breast," says Dr. Rogers, "this remedy is less troublesome, less painful, gives more permanent caustic irritation, and appears to me much more efficacious than blistering, however managed. So strongly am I impressed with this sentiment, that for several years I have trusted no case of the kind to any course of remedies without the aid of that under consideration. In chronic catarrh I have found it of singular utility."* Dr. Rogers has employed them with perfect success to prevent abortion in habits prone to this accident, as well as in the treatment of leucorrhœa and menorrhagia. Issues have likewise been applied with much advantage in vertigo, gutta serena, chorea and tetanus. Dr. Hartshorne, of this city, has employed them with success along the spine, in this latter affection;† and Dr. Lewis, of Pittsburg, has related a case of this disease which yielded to the application of caustic potass along the tract of the spine.‡

When the setons or issues are employed for the removal of local affections, they should be applied as near the affected part as practicable. In general diseases, however, they may be inserted on some convenient part of the extremities, as on the inside of the leg, just below the knee; or on the arm, near the insertion of the deltoid muscle.

The usual mode of forming a caustic issue is as follows:—Take a piece of adhesive plaster, of from three to four inches in diameter; out of the centre cut an oblong or circular piece of the size of the intended issue: the plaster is then to be laid over the part on which the issue is to be formed. Caustic potass, moistened

* American Medical Recorder, vol. iv. p. 222.

† Eclectic Repertory, vol. vii. p. 245.

‡ American Medical Recorder, vol. iii. p. 176.

with water, is now gently rubbed over the skin, presented through the opening in the plaster, until the skin acquires a dark brown color. The caustic must remain on the part about four or five minutes. It is then to be wiped off, and a soft emollient poultice applied, and renewed two or three times daily, until the eschar is thrown off.

RUBEFACIENTS.

The articles which belong to this class do not vesicate, but simply produce a redness and inflammation of the part to which they are applied. Their modus operandi, in the cure of diseases, depends probably on the same principles that have been mentioned above in relation to the operation of epispastics. They concentrate the excitement, and produce a determination of the circulation to the part upon which they immediately act. Without, however, entering into any discussion upon this point, I pass on directly to the consideration of the individual articles of this class.

SEMINA SINAPIS.

Mustard is one of the most useful rubefacients we possess. Its action on the skin is prompt and powerful, producing, when good, pain and inflammation in fifteen or twenty minutes. It contains fecula, mucilage, a bland fixed oil, "and an acrid volatile oil upon which its virtues depend, and which, on standing, deposits a quantity of sulphur and ammoniacal salt." Water extracts nothing but tasteless mucilage from the unbruised seeds; when bruised they impart all their active principles to water; but very sparingly to alcohol. The mode of using this article, as a rubefacient, is to make a paste with the farina of the seeds and water or vinegar, and to apply it in the shape of a poultice to the skin. The pain which such an application produces is generally exceedingly severe, and if suffered to remain on too long, it is apt to occasion troublesome sores. From a series of experiments made on *sinapisms* by MM. Trousseau and Blanc, it appears—1. That black mustard, *fresh* ground, is not more active than that which has been ground for five or six months, and kept wrapped up in paper in a damp place. 2. Sinapisms prepared with *warm* water, act rather more promptly than those prepared with cold water, "but after a few minutes the difference ceases

to be discoverable." 3. "Mustard, mixed with warm water, acts with much greater energy than when mixed with ordinary vinegar, or with acetic acid much diluted; and even with concentrated acetic acid it acts less energetically than with water alone, although acetic acid in this state, if applied to the skin by means of a sponge, or mixed with some inert powder, as sawdust, is a much more powerful irritant than mustard itself, producing much inflammation of the skin in the course of three or four minutes, so that vinegar mitigates the action of sinapisms, and mustard, in its turn, diminishes the irritating property of acetic acid. Good mustard, mixed with water, produces, at the end of six minutes, as much pain as the same mustard, made into a cataplasm with vinegar, does at the end of fifty minutes. Instead, therefore, of expecting greater energy from a mustard plaster made with vinegar, we may now direct this addition as a diluent, with the same view that we order rye meal to be added to the sinapism." *White* mustard was found to act in the same way precisely, whether mixed with water or vinegar. 4. Sinapisms prepared with alcohol are less active than those prepared with vinegar. 5. When sinapisms are made with good mustard, they can seldom be supported longer than about forty minutes, unless sensibility is blunted by opium or cerebral oppression; "and even then, the cataplasm should not be allowed to remain more than an hour in contact with the skin; for though it may be borne many hours, yet if the system react, very severe local inflammation follows, which frequently ends in gangrene, and may even destroy the patient." (Archives Générales, Sept. 1830.) *Sinapisms* are often of great service in the treatment of diseases. In apoplexy and comatose affections they are applied to the feet, in order to produce a revulsion from the engorged vessels of the brain. They are also very beneficial when applied to the abdomen in spasmodic affections of the stomach and bowels, as well as in all painful affections unattended by high arterial excitement. In the low states of fever, they will sometimes manifest very useful effects, by their general stimulant operation, and their tendency, when applied to the lower extremities, of lessening the cerebral congestion, which always exists more or less in the latter periods of typhus fevers. Mustard seed is also used internally as a medicine. The unbruised seeds are particularly recommended in paralysis, dyspepsia, chlorosis, and chronic rheumatism. Powdered mustard mixed with warm water, in the proportion of a tablespoonful of the former to a pint of the latter, acts promptly as an emetic. Administered in this way, it has been much employed as an emetic in epidemic cholera, and, according to some statements, occasionally with signal benefit. The *white* mustard seed is an excellent remedy for indigestion depending on mere torpor

or weakness of the digestive organs. A tablespoonful of the seed swallowed once or twice daily, seldom fails to afford very considerable relief in cases free from inflammatory irritation of the stomach. This remedy is particularly adapted to cases of this kind, attended with habitual costiveness.

CAPSICUM ANNUUM.—CAYENNE PEPPER.

This is an excellent rubefacient. It may be employed for this purpose, either by mixing the powdered capsules in proof spirits, or in the shape of a saturated tincture. In paralysis or torpor of the extremities, and in the low states of fever, friction with either of these preparations is sometimes very serviceable. Wearing socks dusted with red pepper, is said to be very useful in diseases of the bowels attended with cold feet. The cataplasms of capsicum have also been recommended as good applications to the feet, in the delirium and coma of typhus fevers. The diluted juice of the pods has been employed with excellent effects in chronic ophthalmia.

ALLIUM SATIVUM.

Garlic is frequently employed to produce rubefacient effects. It is, however, apt to vesicate, and, where mere inflammation or redness of the skin is desired, it is not so well suited as the two preceding articles. Sydenham speaks highly of the application of garlic to the soles of the feet, as a powerful means of producing revulsion from the head. The late Professor Barton thought it an excellent application in deafness from atony or rheumatism. For this purpose he recommended a clove of the garlic to be surrounded with cotton and introduced into the ear; or wool or cotton moistened with the juice and applied in this way. It has also been employed with success, in the form of an ointment, to discuss indolent tumors.*

OLEUM TEREBINTHINÆ.

Turpentine is strongly rubefacient, and is one of our most common applications for purposes of this kind. There are some peculiar habits, however, in which it cannot be used on account of its occasioning violent smarting and erysipelatous inflamma-

* Thacher's Dispensatory.

tion. It is usually employed in the shape of a liniment, in union with alcohol and other rubefacient articles. When applied to the skin in an undiluted state, it excites considerable pain with redness, and generally a vesicular eruption. It is an excellent application to the throat in cynanche trachealis; and may, indeed, be applied with advantage in all instances where remedies of this kind are indicated. Of the use of this article in burns and scalds, I have already spoken under the head of stimulants.

Formulæ.

℞.—Ol. olivar. ℥x;
Ol. terebinth. ℥iv;
Sulph. acid. ʒii.—Misce. An excellent rubefacient.

℞.—Acid. nitro-muriati. ℥iss;
Ol. terebinth. ℥i;
Axungiæ ℥vi.—M. Highly recommended as a counter-irritating application in phthisis and other internal affections.—*Sapo terebinthinatus, Pharm. Bav.*

℞.—Sapo hispan.,
Ol. terebinth., āā ℔ss;
Carb. potass. ℥i.—Misce. An excellent rubefacient in cold and indurated swellings.

OLEUM MONARDÆ PUNCTATÆ.

The oil of the monarda punctata, a beautiful native plant of this country, is a most powerful rubefacient. Its powers in this respect were first noticed by Dr. E. A. Atlee, of this city, in an interesting paper published in the second volume of the American Medical Recorder. It is exceedingly active, producing heat, redness, pain, and vesication in a very short time, when applied to the skin. Dr. Atlee states, that he has used it with much advantage as a rubefacient liniment, in chronic rheumatism, difficulty of hearing, periodical headache, paralytic affections, cholera infantum, and typhus. "During the prevalence of the epidemic typhus in our city a few years ago," says he, "I was much pleased with its effects in the remarkable sinking state, and coldness of the extremities, to which the patients were subject. The arms, breast and legs were bathed with this liniment,* omitting the laudanum, and in a few minutes a comfortable glow succeeded." In the treatment of cholera infantum, I have myself employed it with great and prompt advantage. By bathing the

* ℞.—Ol. monard. punct. ℥ss;
Tinct. camph. ℥ii;
Tinct. opii. ʒii.—M.

abdomen and extremities with the oil properly diluted, it speedily produces redness of the skin, and very generally relieves the gastric irritability.

From my own experience with this oil I am satisfied that it is one of the most active rubefacients we possess, and that it will be found to answer exceedingly well in all cases where such remedies are indicated.

AQUA AMMONIÆ.

This article is very frequently employed as a rubefacient. In union with sweet oil it forms an excellent application in a variety of affections. Pringle thought it particularly useful in cynanche tonsillaris, and it is still much used as a liniment to the throat in this and other similar affections. Its rubefacient powers are, however, not very great, its application being seldom followed by much redness, unless in young subjects.

CAMPHORA.

Camphor dissolved in alcohol is one of our most common rubefacients. The celebrated Steer's opodeldoc consists of soap ℥vii, alcohol ℥ii, camphor ℥ii, liquor ammon. ʒiv, and oil of rosemary ʒss. This mixture is a very useful stimulating liniment in rheumatic affections. Dr. Ferriar recommends the following ointment as an efficacious application in lumbago. He speaks very highly also of frictions with camphor dissolved in vitriolic ether. According to Scudamore, one of the best embrocations in subacute rheumatism, and gout, is a mixture composed of three parts of the *mistura camphorata*, and one part of alcohol. After the violence of the inflammation has been considerably reduced, by proper antiphlogistic measures, important relief may often be derived from the application of this mixture. Strips of flannel should be moistened with it, and laid over the inflamed joint.

℞.—P. camph. ℈ii; ung. basilic. ℥i; sapo. ℥ss; pulv. sem. sinap. ℈i. M. ft. unguent.

TINCTURA CANTHARIDUM.

The tincture of cantharides possesses but feeble rubefacient powers; it does not, like most of the other articles that have been mentioned under this head, produce much burning heat in the part to which it is applied, and it is seldom even that it can be

made to produce much redness of the skin. It has nevertheless been recommended as peculiarly serviceable in chronic rheumatism and paralytic affections. A decoction of cantharides in the oil of turpentine, however, forms one of the most active rubefacient agents we possess. This decoction is frequently employed for the purpose of hastening the vesicating effects of epispastics. If previous to the application of the epispastic the part be rubbed with this liquid, vesication will take place in a few hours.

PIX BURGUNDICA.

This resinous substance is obtained from the Norway spruce fir, (pinus abies,) by making incisions through its bark. Spread on leather, it is much employed as a rubefacient application, and its effects are, indeed, often highly useful. When applied to the skin, it generally begins to produce a prickling heat in the course of about twenty-four hours, followed commonly by numerous small red pimples exuding a serous fluid, and occasionally also by vesication. In lumbago a plaster of this substance worn over the loins often proves very serviceable. Applied between the shoulders or to the breast, it is also frequently attended with very good effects in diseases of the lungs, particularly in chronic catarrh, hooping-cough, and spitting of blood. In chronic diarrhœa and dysentery I have known very excellent effects to arise from a large Burgundy pitch plaster worn on the abdomen. Enveloped in cotton and introduced into the ear, it has been found serviceable in difficulty of hearing depending on a rheumatic affection or atony of the ear.

ERRHINES.

These are medicines, which, when applied to the Schneiderian membrane, increase its natural secretions. In persons not habituated to their use, they generally produce sneezing, and hence they are also called sternutatories. The practical application of these remedies is but very confined. Their use is restricted exclusively to the cure of some affections of the head. Their modus operandi is not difficult to understand. By irritating the Schneiderian membrane, they occasion an afflux to this organ, and an increase of its secretions, and consequently a derivation of the circulation from the surrounding or neighboring parts. Hence,

they have been found serviceable in rheumatic affections of the head, in pains of the ear, in ophthalmia, toothache, and various other affections of these parts. I proceed to mention a few of the principal articles employed as errhines.

NICOTIANA TABACUM.

Tobacco, in the form of snuff, is extensively used as a luxury. In persons not habituated to its use, in this way, it acts as a pretty powerful errhine. By repetition, however, it soon loses its power of increasing the discharge from the nose; and on this account, it can seldom be employed with particular advantage in cases that require a pretty long use of such a remedy. It has been said that when snuffing produces a considerable discharge from the nose, which is sometimes the case even in such as take it habitually, it cannot be laid aside without the risk of injurious consequences. "From my own experience," says Dr. Cullen, "I am led to repeat here, that whenever the discharge has been considerable, the laying aside snuffing, and therefore suspending that discharge, may have very bad effects." All artificial discharges become constitutional by long continuance, and can seldom be checked suddenly without producing injurious effects.

ASARUM EUROPÆUM.

The asarabacca, besides its emetic and purgative properties, is powerfully errhine. When snuffed into the nose it produces violent sneezing and a copious discharge of mucus from the nostrils, and frequently also a plentiful secretion of saliva, continuing sometimes for several days. It must be employed in moderate doses, as its effects are often exceedingly violent when snuffed in large portions. A few grains of it snuffed once or twice a day have been known to produce excellent effects in toothache, ophthalmia, headache, and other affections of the head.

HELENIUM AUTUMNALE.

This is a syngenesious plant, indigenous to the United States, in many parts of which it grows in great abundance. The whole plant is intensely bitter, and may be usefully employed as a tonic. As an errhine, the powdered leaves are recommended by the late Professor Barton as safe and valuable. I have prescribed it in a few cases, and found it to produce profuse discharges of mucus

from the nose. It is less violent in its effects as a sternutatory than the asarum, and produces quite as much discharge.

TURBETHUM MINERALE.

This is a very valuable errhine. It seldom fails, when snuffed up the nose, to produce very copious fluid discharges. When employed for this purpose, it is generally mixed with the powder of asarum, or with common snuff. In affections of the eyes and ears, this errhine has been found to produce valuable effects. Dr. Barton states, that he has employed it in cases of epilepsy, gutta serena, &c., and that he can confidently recommend it as a remedy entitled to attention. In two instances in which he used it, considerable salivation was produced.

Various other errhines are mentioned by writers on the materia medica, but of which I consider it superfluous to give any particular account. It will be sufficient merely to mention their names, the principal of which are beta, betonica, majorana, hedera terrestris, euphorbium, origanum, achillea, ptarmica, &c.

CHAPTER XIV.

II. *Medicines that increase the Action of the Urinary Organs.*

DIURETICS.

Diuretics are such remedies as promote the discharge of urine. Some articles of this class appear to be absorbed into the circulation, and act directly upon the secretory vessels of the kidneys. Others produce their effects in a more indirect manner; acting primarily on the stomach, and propagating a sympathetic action to the kidneys. There are others that act by promoting absorption, augmenting thereby the quantity of serous fluid in the blood-vessels, in consequence of which the renal emunctories are excited into increased action.*

That many articles of this class are absorbed into the circulation, and act directly upon the secretory vessels of the kidneys, is demonstrated by the re-appearance of those substances in the urine. I have, however, already dwelt particularly on this subject when speaking of the general modus operandi of medicines, and shall therefore not say anything further on this point, in the present place. With regard to the latter mode of producing diuresis, that is, by exciting the action of the absorbents and inducing serous repletion of the blood-vessels, it will be proper to be more explicit. The emunctories of the animal system are outlets to the effete matters, or the superabundant and imperfectly animalized fluids, circulating in the blood-vessels. They are "the scavengers of the animal economy," whose activity is proportionate to the mass of materials which is to be thrown off. If the blood be deprived of its serous parts by dropsical effusion, the skin and kidneys, being less excited to active excretion, on account of the deficiency of the materials which they are destined to remove, become inactive, whilst the exhalants, from which the dropsical effusion takes place, continue, by a sort of vicarious office, to separate from the blood its watery portion.

If in this state we prescribe a remedy whose effect is simply to excite the secretory vessels of the kidneys, as, for instance, squills,

* Murray's Materia Medica.

we will seldom produce any augmented secretion of urine, because the necessary materials for the secretion of the urine do not exist in sufficient abundance in the blood. If, however, we unite with this simple diuretic another article, possessing the power of exciting the re-absorption of the effused fluid, we at once stimulate the vessels of the kidneys, and furnish them with an augmented portion of the materials of secretion. It is on this account that we often derive so much advantage from the union of squills and calomel in dropsy; and it is upon the same principle that the action of diuretics is increased by copious draughts of mild diluents. The system appears to be equally incapable of bearing, with impunity, too small or too large a portion of serous fluid in the blood. As soon as this part of the circulating mass becomes more than ordinarily augmented, the kidneys, or the skin are excited into action to reduce its quantity; and hence, we often excite the action of the kidneys, by indulging our patients in the free use of mild drinks. But although diluents are certainly useful, in cases of dropsy, to excite the action of the kidneys, yet when once this effect is produced, and the absorption of the effused fluid takes place, they ought to be less liberally used, since, by supplying the blood-vessels with a sufficient quantity of watery fluid, there will be less demand made upon the absorbents, and consequently a slower reduction of the dropsical effusion.

The action of diuretics is also promoted, in *full* and phlogistic habits, by whatever lessens arterial excitement, or diminishes the quantity of fluid circulating in the system. Thus, bleeding and cathartics sometimes do essential service in this way. There is no contradiction in this statement, to the one made above—that copious draughts of diluents often increase the efficacy of diuretics, by furnishing the vessels with a more abundant share of watery fluids. In opposite states of the system these contrary means produce, indeed, precisely similar results. They both increase diuresis by favoring the absorption of watery fluid. The only difference that subsists between bleeding and plentiful dilution in this respect is, that the former increases the activity of the absorbents, and lessens the rapidity of serous effusion, whilst the latter acts simply by furnishing the absorbents of the alimentary canal with a greater quantity of fluid for absorption. It must also be observed that bleeding and catharsis can only be useful in this respect in cases where the blood-vessels are full and active; whilst, on the contrary, copious draughts of bland liquids are particularly suitable, where the system is less plethoric, and the blood has already been much exhausted of its serum. It is not difficult to understand in what manner the discharge of urine is augmented by the plentiful use of water; but how depletion, or the reduction of arterial excitement, acts in increasing the vigor of the absorb-

ents we are not able to explain. The fact, however, is fully ascertained, not only by the effects of bleeding and purging in the treatment of dropsy, but also by the direct experiments of Magendie, who has recently demonstrated, what, indeed, has been noticed before, that absorption is accelerated or retarded in proportion as the quantity of fluid circulating in the blood-vessels is increased or diminished.*

Much dispute existed formerly with regard to the propriety or impropriety of allowing dropsical patients to indulge freely in the use of mild and diluent drinks. Although copious draughts of water will in general increase the quantity of urine, I can, nevertheless, not believe that any essential advantage will often result from a very great indulgence in this way. For if the urine be increased by the copious use of drink, it is to be observed, that the source of this increase is not so much in the absortion of the dropsical fluid deposited in the cavities of the body, as in the absorption of the water taken into the stomach aud bowels from without. Hence it is, that however copious the discharge of urine, dropsical swellings will often diminish but triflingly, or remain stationary, or even increase. To torture the patient, however, with excessive thirst, is not only useless, but absolutely pernicious. A pretty free use of mild drinks should always be allowed; thirst ought never to be suffered to become so intense as to produce general irritation.

It may be observed, as a general rule, that in all cases in which the blood contains an excess of serum, copious draughts of diluent drinks should be avoided. Where, on the contrary, the blood is found to contain but a small proportion of serous fluid, the crassamentum being in excess, the free use of bland drinks may be advantageously allowed.

How an increased secretion of the kidneys can reduce dropsical accumulations, is difficult to perceive. It cannot be wholly from any direct action which diuretic remedies may exert on the absorbent system, since we have it from very high authority† that dropsies have been cured by the free use of diluent drinks alone; and it will hardly be contended that such a remedy could exercise any direct influence over the absorbents. I am inclined to believe that the explanation must be sought for in the following circumstances. When the discharge from the kidneys is much increased, in a case of dropsy, we not only determine the serous discharge to these emunctories, but lessen the general mass of this portion of the blood, and consequently lessen the effusion from the exhalants furnishing the dropsical fluid. Now, if the exhalation from

* Journal of Experimental Physiology, by M. Magendie, 1821.

† Dr. Cullen.

these vessels be diminished, and the regular discharge from the kidneys be re-established, the dropsical accumulations must gradually disappear, although the absorbents remain in the same condition, with regard to the degree of their activity. But independent of this effect of diuresis in diminishing accumulations of effused fluids, there are other results which we have reason to believe take place, concomitantly with those just mentioned, and which still further increase the efficacy of diuretics in dropsy. I have stated above that depletion favors, in a very decided way, the absorption of fluids; hence when the blood-vessels are suddenly deprived of a portion of their serous fluid, by the action of a diuretic, nature making an effort to sustain the necessary proportion of this component part of the circulatory mass, excites the absorbents into more vigorous action, in order to supply the deficiency which the animal economy experiences.

From the great and rapid reduction of strength produced by excessive discharges of urine, as in diabetes, it is evident that the general powers of the system are much under the control of diuretic remedies. They are accordingly often employed as depletory remedies in sthenic diseases. In gout and rheumatism especially, they have been recommended as highly useful, when employed in conjunction with cathartics. Dr. Scudamore, speaking of the treatment of this disease, says, "In imitation of nature's efforts to remove redundant matter by the medium of the kidneys—an action, the existence of which I think myself entitled to infer from my experiments—we are to keep the corresponding treatment attentively in view; and I have invariably employed, with the greatest advantage, purgative and diuretic medicines conjointly, so that the exhalant vessels of the alimentary canal and the secreting function of the kidneys, are stimulated to increased action at the same time."*

In the treatment of chronic dysentery, too, diuretics have been prescribed with a view of determining the discharge of fluids from the intestinal vessels to those of the kidneys.† Celsus, in his account of the treatment of dysentery, says, "Et ea, quæ urinam movent, si ea consecuta sunt, in aliam partem humorem avertendo prosunt."‡ On the principle here mentioned by Celsus, diuretics are sometimes found to produce useful results in affections of the breast and head. I have known a case of gutta serena cured by the employment of cream of tartar and calomel in large doses, the immediate and only sensible effect of which was constant and copious diuresis.

* Scudamore on Gout, p. 100.

† Bampfield on Tropical Dysentery, p. 165.

‡ Celsus, de Medicina, lib. iv. cap. xv., de Dysenteria.

Diuretics have also been known to produce beneficial effects in certain affections of the pulmonary organs. Upon this subject Dr. Armstrong makes the following interesting observations:— "The apparent benefit which I have seen to result from sudorifics and diuretics, in some cases of threatened consumption, would alone seem to indicate the applicability of medicines which act upon the kidneys and skin in certain examples; but as my own experience is defective on this point, I recommend it to the notice of others, as well from practical as pathological considerations." Again, he observes: "As the skin and *kidneys* both closely sympathize with the lungs, is it probable that diseases of the latter might be benefited by certain articles of food which operate on the former?"

Diuretics are said to be a powerful auxiliary in the cure of ulcers situated on the lower extremities, and attended with œdema of the leg.*

In various affections of the urinary organs, diuretic remedies are especially indicated, and often afford very decided advantages. In ulcers of the kidneys, or inflammation of the mucous lining of the bladder and urethra, balsamic diuretics may in general be usefully employed. These appear to act, in the cure of affections of this kind, by medicating the urine, which, coming into immediate contact with the diseased part, acts upon it as a local remedy. It is in this way, no doubt, that balsam copaiva and turpentine cure gonorrhœa. They impregnate the urine with their peculiar medicinal qualities, which, being passed through the urethra, acts upon it in the same way that injections do.

If we admit, as I am fully disposed to do, that diseases do occasionally depend on a deteriorated state of the blood, we must regard diuretic remedies as a most important class of medicinal agents in the cure of such diseases. The kidneys, perhaps, more than any other emunctory of the animal economy, are an outlet to such portions of the circulatory mass as are effete, or foreign and inimical to the regular actions of the system. We find, too, that the solution of diseases is more frequently attended by a critical discharge of urine than by any other of the excretions. Diuretic remedies have accordingly been recommended in a variety of chronic diseases, which appear to be accompanied by a morbid condition of the fluids; such as scurvy, elephantiasis, &c.

In the beginning of this chapter it is stated that cathartics promote the operation of diuretics. It must be observed, however, that quite the contrary effect ensues from purging, when induced either by the diuretic medicine itself, as sometimes occurs when the dose is very large, or from the simultaneous exhibition of

* Lond. Med. and Phys. Journ., No. 162.

some cathartic medicine. When purging is thus produced, a check is put to the absorption of the diuretic remedy, in consequence of the rapidity with which it is hurried through the alimentary canal; and there is, moreover, a direction given to the discharge of the humors, by the intestinal exhalants. These observations are particularly applicable to the saline diuretics, having a *vegetable* acid as a constituent. "The supertartrate of potass, or *cream of tartar*, acts in well regulated doses, as we all know, upon the kidneys, the tartaric acid being in this case abstracted, and assimilated by the digestive process, and the alkaline base at the same time eliminated and subsequently absorbed; but if we increase the solubility of the compound, by reducing it to the state of a neutral tartrate, (*soluble* tartar,) or by combining it with boracic acid, or some body that has a similar effect; or, what is equivalent to it, if we so increase the dose of the cream of tartar that catharsis follows its administration, then diuresis will not ensue, since no decomposition can take place under such circumstances; for it is a law of the animal economy, *that the process of assimilation and absorption is arrested, or very imperfectly performed during any alvine excitement.*"*

DIGITALIS PURPUREA.—FOXGLOVE.

Under the head of Narcotics, an account is given of the remedial effects of digitalis, so far as they seem to depend on its sedative virtues. In the present place, therefore, I have only to speak of it in relation to its property as a diuretic—a property to which, indeed, it owes some of its most important medicinal effects.†

* Paris's Pharmacologia.

† The appearances of the urine were at one time regarded as of the utmost consequence, in forming a proper opinion of the character of diseases.—At present this excretion is unquestionably too much neglected; by an attention to it we will often be greatly aided in our judgment of the nature of diseases. Dr. Prout observes, "A diminished flow of urine accompanies active inflammation, and an inflammatory state of the system in general. The urine is invariably of a deep color.

"An increased flow of urine, or diuresis, very constantly accompanies those diseases connected with a peculiar state of nervous irritability, as hysteria. It may be also produced by certain passions of the mind, as fear. Lastly, it may be induced by local irritants acting on the urinary organs themselves. In those cases the urine is always of a pale color.

"Thus, generally speaking, nothing can be more opposite than the conditions of the system, and consequently the principles of practice, indicated by a diminished or increased flow of urine. Hence, they are symptoms of pri-

The diuretic powers of this medicine seem to be entirely independent of its narcotic effects. It is even stated by some very eminent writers, that its diuretic and narcotic operations are incompatible. Dr. Ferriar observes, "that when given in such quantities as to excite nausea, or to produce evident narcotic effects, it does not operate as a diuretic." Withering expresses the same opinion.

Although it must be admitted that the sedative and diuretic powers of digitalis are very generally exerted independently of each other, yet there can be no doubt that though not necessarily connected, they are occasionally found to act concomitantly, and are at least not incompatible.* Conceiving that the curative powers of digitalis in dropsy are dependent upon its sedative effects, Blackall and Paris disapprove of the common practice of prescribing this remedy in combination with calomel, since this latter article always excites the action of the heart and arteries, and is, therefore, inconsistent with the sedative operation of digitalis. I feel persuaded, however, that this objection is entirely hypothetical, and wholly unsupported by experience and correct observation. Were it a fact that the diuretic effects of this medicine are dependent on its sedative powers, the impropriety of such a combination would be evident; but as no such dependence exists, inasmuch as the diuretic effects of the medicine are generally most conspicuously evinced when the action of the heart and arteries is least reduced, and, on the contrary, often entirely wanting when the sedative effects are most powerful, it does not seem reasonable to ascribe any unfavorable consequences to the mere stimulant effects of calomel upon the diuretic operation of digitalis, with which it is, sometimes, combined. Although digitalis occasionally acts very powerfully as a diuretic, it is not to be regarded as very certain in its operation. In general, where it produces any good effects in dropsy, it does not require a long time before it manifests its diuretic powers. Dr. Ferriar observes, in relation to this point: "If no beneficial effects be perceivable in the course of a few days, I exchange the digitalis for some other diuretic." I have myself repeatedly noticed this circumstance, in my experience with this remedy;

mary importance in all diseases in which the urine is concerned; and, whatever may be the disease, seldom fail of furnishing us with a clue to the principles upon which it is to be treated."—*An Inquiry into the Nature and Treatment of Gravel, Calculus, and other Diseases connected with a deranged operation of the Urinary Organs*, Lond. 1821, p. 35.

* Dr. Ferriar observes, "that the diuretic action of digitalis, though independent of its sedative powers, may sometimes take place in conjunction with the latter, and may even co-operate with it, by its effect on the system as an evacuant."—*Essay on Digitalis.*"

and I believe, that it will seldom be proper to continue it more than seven or eight days, if no manifest diuretic effects ensue.

Great diversity of opinion exists among writers concerning the remedial powers of this medicine in hydropic diseases. Some physicians of eminence have extolled its virtues in the most extravagant terms; whilst others have not been willing to concede to it any properties in this respect whatever. The weight of good testimony is, however, in favor of the anti-hydropic virtues of this article, and almost all agree in opinion at present, that though not very commonly adequate to the cure of dropsy, it is nevertheless a remedy of valuable powers, and deserving of particular attention in the treatment of such affections.

Dropsy is a disease by no means so uniform in its character and causes as is generally supposed. It arises in the most opposite states of the system, with regard to vascular action and repletion; it may depend on various organic affections; or appear as a consequence of different acute and chronic diseases; and the urinary secretion varies essentially in character in different cases. These circumstances point out some diversity in the character of the disease itself, and it is not reasonable to suppose, that any particular remedy is equally applicable to the disease under all these diversities of disposition. It appears, indeed, from the experience of physicians, that digitalis is peculiarly under the influence of circumstances of this kind, and hence, no doubt, have arisen the contradictory statements that have been made by writers concerning the anti-hydropic effects of this medicine. By Dr. Withering we are informed, that, in his practice, the digitalis seldom succeeded in curing ascites or anasarca, in persons of tense fibre and great general strength of system; on the contrary, however, it hardly ever failed to produce conspicuous diuresis in persons having a feeble or intermitting pulse, much laxity of fibre, with a pale countenance and cold skin. Dr. Maclean, in his excellent work on hydrothorax, confirms these observations, and observes, in addition to what Withering has said, that he seldom derived any benefit from the medicine in persons of a fat, corpulent habit, connected with a dull, sluggish, inirritable fibre, but that he generally succeeded well in relieving those of a "weak, delicate, irritable constitution, with a thin, soft, smooth skin, which in the anasarcous limb is transparent."

Dr. Thomas states, that in cases where the urine does not coagulate by heat, he usually found digitalis unsuccessful; where the visceræ were sound, however, or the habit not entirely depraved, he found it to succeed. He also observes, that when the digestive organs fail, and there is frequent sickness or diarrhœa, with a bad habit of body, the use of this remedy has appeared to be injurious. With regard to its relative value in hydrothorax, ascites and ana-

sarca, the evidence of practitioners is contradictory, and does not afford any conclusions worthy of confidence. Dr. Blackall, who has paid very great attention to the different varieties of dropsy, and especially to circumstances connected with the urinary secretion, observes, that in dropsies consequent to scarlatina, in which he invariably found the urine to coagulate by heat, he derived important advantages from the use of digitalis, in conjunction with blood-letting.

As digitalis generally operates more beneficially in dropsy, when united with other diuretic or hydragogue remedies, it is not commonly employed alone, but combined usually with calomel, squills, Dover's powder, cream of tartar, &c. Dr. Ferriar was in the habit of giving cream of tartar early in the morning, in doses sufficient to purge, and digitalis with opium, in increasing doses every evening. If there was naturally a tendency to purging, he gave the digitalis "in half-grain doses, at intervals of five, six or eight hours, with the usual precautions." I have seldom employed this medicine by itself in dropsy. My practice has almost invariably been to combine it with acetate of potass or squills, and frequently also with calomel and Dover's powder, as directed by Dr. Ferriar.* Squills and the saline diuretics appear to be particularly qualified to increase the diuretic properties of digitalis. The reason of this does not appear to be very difficult to explain, if we adopt the opinion expressed by Dr. Maclean concerning the modus operandi of this medicine as a diuretic. He regards the beneficial effects of digitalis in dropsy, as dependent mainly upon its powers of increasing the activity of the absorbents. This opinion derives very considerable support from the fact, that this remedy very rarely produces any diuretic effects in persons unaffected by dropsical effusions, and in whom, consequently, no sudden repletion of the vessels by absorption, can take place. The same circumstance takes place with regard to the operation of calomel. In subjects where no effusion exists this remedy hardly ever manifests any diuretic operation. In persons, however, laboring under dropsical collections, the diuretic effects of this medicine are often very powerful and sudden. These effects can hardly be explained upon any other principle than the absorption of the dropsical collections, in consequence of which the vessels become suddenly overcharged with serous fluid, which is eliminated either by the bowels in the form of a diarrhœa, or by the salivary glands, or by the kidneys. If these views be correct, and I am much inclined to put confidence in them, the fact that

* The formula which Dr. Ferriar generally used, contains pulv. digitalis gr. ½; calomel gr. i; pulv. Doveri gr. viii; made into pills. To be taken at bed-time, and repeated during the day according to circumstances.

squills and some of the saline diuretics have a tendency to increase the diuretic operation of digitalis, would appear to be explicable upon the principles mentioned in the preliminary observations to this chapter; namely, that, whilst the absorption of the effused fluid is increased by the action of the digitalis, and consequently a greater portion of serum poured into the blood-vessels, the other remedies act more immediately upon the kidneys, and increase their functions, by which the absorbed fluid is again discharged. From this view of the subject we see, too, why calomel has a greater tendency to increase the diuretic effect of squills than of digitalis, for with the former it produces the double and direct effects of absorption and renal action, whilst with the latter it can only produce increased absorption, which may or may not excite the action of the kidneys.

The best form for administering this medicine, with a view to its diuretic operation, is an infusion of the leaves. The infusion of digitalis, directed by the London and Edinburgh Dispensatory, may be taken in the dose of from ℥ss to ℥i twice a day, and gradually increased, until symptoms arise which require its suspension, such as slow pulse, accompanied with nausea, palpitations, faintness, purging, and great prostration. Dr. Blackall, in his excellent treatise on dropsies, mentions another symptom of the undue effects of this medicine, which it may be of importance to bear in mind: he states that the continued use of digitalis, or an over-dose of it, occasionally produces a tensive pain of the head, extending sometimes over one eye, and attended with a disturbance of the brain, which precedes other bad symptoms, and which, if not attended to and speedily obviated, often terminates in convulsions or death.

Its narcotic effects, when too violent, are best counteracted by stimulants, such as brandy and water, opium, and volatile alkali, &c. The sulphate of iron, and the infusion of cinchona, produce precipitates when added to the infusion of digitalis.

Formulæ.

℞.—Pulv. digitalis,
Calomel, āā ℈i;
Pulv. scillæ ℈ii;
Conserv. rosar. q. s.—M. Divide into twenty pills.
Dose, one pill three times daily.

℞.—Acid. tartar. ℈i;
Sodæ carbon. gr. xxiv;
Iufus. digitalis fl. ℥ss;
Spir. nitr. dulc. ℥i;
Tinct. scillæ gtt. x;
Aq. menthæ ℥ii.—M. Dr. James Johnson recom-

mends this mixture as a valuable diuretic in ascites. The whole of the mixture is to be taken at once, and repeated twice or three times daily.

℞.—Pulv. digitalis gr. xii;
Calomel gr. viii;
Pulv. Doveri gr. xxxii.—M. Divide into eight equal powders. Take one every six hours, in hydropic cases attended with gastric or intestinal irritation.

SCILLÆ RADIX.—SCILLA MARITIMA.—SQUILL ROOT.*

This is one of the most certain, efficacious and valuable diuretics we possess. Like digitalis it is rendered much more active in its operation as a diuretic, by combining it with some other articles of this class, and particularly by giving it in union with calomel. I have already spoken of the propriety of uniting it with calomel, in cases where we wish to evacuate dropsical effusions. The squill seems to increase diuresis by stimulating the kidneys to invigorated action, and calomel, it is well known, has a powerful tendency to promote absorption. By uniting these articles together, therefore, we obtain a remedy which enables us at once to excite the action of the absorbents and the kidneys, and thus, in the most effectual manner, promote the removal of dropsical collections. The late Dr. Home, of Edinburgh, supposed that the diuretic effects of this medicine were greatly enhanced by uniting it with such articles as are capable of promoting its emetic operation; or by giving it in sufficient doses to produce decided impressions on the stomach and bowels. Directly the reverse of this opinion was strenuously advocated by Dr. Cullen, who maintained that the diuretic effects of the squill are generally much less conspicuous when it operates strongly on the stomach and intestines, than when it produces no sensible operation on these organs. The reason of this he conceived to be, that by such effects on the bowels the medicine is "prevented from entering the blood-vessels, and thereby reaching the kidneys." Whether we admit this explanation or not, the fact is, I believe, fully established that not only this, but every other article belonging to this class of remedies, is less apt to produce diuresis when it either purges or vomits, than when no such effects are produced. Upon this subject Dr. Blackall observes, "it never operates so favorably as when it is given in the fullest quantity which the patient can bear without sickness." This corresponds with the experience of other writers who speak of this remedy. It appears to be admitted on all

* A particular account of the natural history of this root has already been given under the head of Emetics.

hands, that the remedy is, in general, more apt to afford relief in hydrothorax, than in any of the other varieties of dropsy.* "In the early stage of this disorder," says Dr. Blackall, "medical treatment does a great deal, principally by means of diuretics: and squills is by far the most powerful of them." "It is particularly useful," he says, "where, with an oppression of the chest, the urine is scanty, high-colored, full of sediment, and without serum. Its use, however, is not limited to this state; I have sometimes seen it render service where the urine is partially coagulable. But in proportion as that symptom becomes more marked by its extreme constitutional characters, inflammation, and a weakness of the digestive organs, it fails in its effect, or is even injurious." He recommends it to be given, at first, in doses of thirty drops of the vinegar or tincture, three times a day, and gradually increased to forty or fifty drops. When it does not act entirely as it could be wished, "the addition of a grain of calomel," says the same writer, "every night, is frequently followed by a great flow of the urine at the same time that the salivary glands are affected." Dr. Maclean, also, speaks in very high terms of the efficacy of squills and calomel in hydrothorax. I have myself uniformly obtained more advantage, in this disease, from these two articles in union with nitre, than from any other diuretic I have ever employed. Such a combination is particularly efficacious when it produces inflammation of the gums and the glands about the throat. The reason why calomel and squills are more apt to afford relief in hydrothorax, than in the other varieties of dropsy, may be owing to a threefold operation; it promotes absorption, excites the urinary discharge, and, by determining the circulation particularly to the glands of the mouth and throat, it causes a derivation from the exhalants of the pleura, and thereby lessens the dropsical exhalation. The exhalants of the cavity of the thorax would be more likely to be influenced by such an afflux to the glands of the mouth and throat, than those situated more remotely, and hence, perhaps, arises the more speedy relief which is commonly procured in hydrothorax by such a combination of remedies, than in ascites and anasarca. The expectorant operation of squills is also a circumstance which would seem to render it more suitable in dropsies of the chest than the other diuretics.

The diuretic operation of squills is said to be assisted by the mistura ammoniaci and spiritus ætheris vitriolici;† and Dr. Ferriar observes "that, in some habits, the combination of tincture of squills with syrup of buckthorn, proves very powerfully diuretic."

* Blackall, Maclean, Van Swieten, &c.

† Blackall.

Dose: from one to four grains in substance. Tincture and vinegar of squills, from thirty to sixty drops.

Formulæ.

℞.—Pulv. scillæ ℈i;
—— nitrat. potass. ʒii;
Calomel gr. v.—M. Divide into ten equal parts. Dose, one powder every four hours.

℞.—Pulv. scillæ gr. viii;
—— pip. nigr. gr. x;
—— nitr. potass. gr. xviii;
Calomel gr. iv;
P. opii gr. ii.—M. Divide into three equal parts. Take one every morning, noon and evening. According to Richter, this is a peculiarly useful diuretic in hydropic cases, attended with much languor and relaxation of the system.

℞.—Pulv. scillæ gr. xv;
Calomel gr. v;
Pulv. Doveri ℈ii.—M. Divide into ten equal parts. Take one three times daily. This mixture is well adapted in hydropic cases, attended with gastric or intestinal irritations.

COLCHICUM AUTUMNALE.—MEADOW SAFFRON.

The colchicum autumnale is a perennial plant, growing in abundance in the temperate climate of Europe, and may be conveniently cultivated in our gardens. "The root is a double succulent bulb. The flower is large, of a purple color, and comes directly from the root. The leaves appear in spring, and are radical and spear-shaped. Corolla, consisting of a simple petal, divided into six lance-shaped erect segments. Capsule three-lobed, divided into three cells, containing globular seeds, which are not ripened until the ensuing spring, when the capsule rises above the ground upon a strong peduncle. It flowers in autumn, when the old bulb begins to decay, and a new one is formed. In the following May the new bulb is perfect, and the old one wasted and corrugated. The roots are dug for use in the beginning of summer.*

When fresh, the root possesses extremely active powers, producing, according to the observations of Stœrck, when taken in a dose less than a grain, "a burning heat and pain in the stomach and bowels, strangury, tenesmus, thirst, total loss of appetite," and in larger doses, violent, and even fatal effects. Its active

* Thornton's Family Herbal.

principle resides in a milky fluid, and consists of a peculiar alkaline principle, similar to the veratria obtained from the white hellebore. It contains extractive matter, "which, when in solution, undergoes a chemical change." It has been ascertained by Sir E. Home, that the deposit which takes place in the vinous infusion, produces nausea and griping, and that the efficacy of the medicine is not destroyed by removing the deposit. The alkaline principle exists in combination with gallic acid;* which, when snuffed into the nose, produces violent sneezing, and vomiting and purging when swallowed. Colchicum, taken in duly regulated doses, acts as a sedative upon the nervous and sanguiferous systems, allaying inflammatory pain, and moderating the action of the heart and arteries. It possesses also considerable diuretic properties, and, when taken in full or frequently repeated doses, it produces nausea and copious purging. Neither of these evacuant effects is, however, a very constant result of its exhibition, nor does it appear that either is essential to its remedial influence, in many of the diseases for which it is prescribed.

It is thought by many, that the colchicum autumnale, which has of late become so important a remedy, is the hermodactylus of the ancients. This appears, indeed, very probable, when we compare the description which Dioscorides gives of colchicum, with Withering's account of the English meadow saffron. They agree perfectly in giving the very same distinguishing marks to the plant which they respectively describe. Now Serapion, in his description of hermodactylus, employs "the very words in which Dioscorides describes colchicum."† It is, therefore, quite evident, that these writers must have had the same plant in view in their descriptions. It appears, also, that in England, at no very remote period, colchicum was known by the name of hermodactylus. "In an English translation of Wirtzung's Praxis Medicinæ Universalis, printed in the time of Queen Elizabeth, we have the following passage: 'Hermodactylus, in Greek colchycum, in Latin ephemerum deleterium. Our common hermodactylus is the hermodactyle root and true colchycum, which Galen calleth ephemerum deleterium.'"‡ And Sir John Hill says, in his British Herbal, that "no one who has seen the hermodactylus of the east, and compared it with the meadow saffron of England, can for a moment doubt that they are the same plant."

The colchicum was in high repute among the ancients, and prescribed for the very diseases in which it is at present so much

* Annales de Chimie, tom. xiv., Mai 1821.

† Medical Sketches, B. G. Kerr. From this little work I have drawn the principal part of my historical account of this plant.

‡ Ibid.

commended. It had, however, nearly sunk into total neglect, when Mr. Want, of London, within a few years past, again brought it into notice, as forming the active principle of the *eau medicinale* D'Husson, so much extolled for its remedial powers in gout. This opinion concerning the identity of the colchicum and the eau medicinale, is advocated by Sir Everard Home, in a paper published in the Philosophical Transactions;* but is strongly contested by Scudamore and others.

Be this as it may, it seems to be conceded very generally, that the colchicum is a remedy of great powers in gout and rheumatism. It is not, however, allowed on all hands to be always a very safe remedy. It is stated by very high authority, that although generally speedily effectual in removing the local symptoms of pain and inflammation in gout, it has a tendency "to leave the disposition to the disease much stronger in the system, and lead to still more calamitous, because still more constant pains of the chronic form of the disease."†

This writer, however, does not disapprove of colchicum when properly administered, but speaks of it, on the contrary, in terms of confidence and praise. When given in the subjoined formula,‡ "it produces all the good effects," he says, "of which the medicine in its other forms is capable, and is not chargeable with any one ill consequence."

I have myself employed the colchicum, both in acute and chronic gout, and in most cases with prompt and complete success. Its remedial powers, in gouty inflammation, are indeed very extraordinary. I have known violent attacks of acute gout completely subdued in the course of twenty-four hours by its use; and in no instance have I witnessed any injurious consequences to result from its employment.

Colchicum is also a valuable remedy in rheumatism. Its use was, at first, entirely restricted to the chronic and subacute forms of the disease. Experience, however, has shown that it may be safely and often very beneficially administered even in the most inflammatory cases of the complaint. When administered, in acute cases, until it excites purging, it seldom fails to moderate the local inflammation and general arterial excitement, rendering the pulse smaller, softer and less frequent, and mitigating, very considerably, the severity of the pain. Mr. Haden asserts that, in his practice, "it has proved itself a remedy of eminent power, in

* Part II. 1816.

† Scudamore on Gout, p. 108, Amer. edit.

‡ ℞.—Magnes. grs. xv ad xx; magnes. sulphat. ʒi ad ʒii; aceti colchici ʒi ad ʒii; with distilled water most agreeable, and sweetened with syrup. To be taken at once, and repeated every four or six hours.

controlling the action of the heart and arteries, and in curing those states of the constitution which we are taught to name diseases of excitement."* In pure inflammations, he says, if given every four hours until it purges freely, the pulse will become nearly natural, from being either quick and hard, or slow and full. The form in which he employed this remedy is a powder, composed of one part of powdered colchicum, three of carbonate of potash, and five of sulphate of potash. Of this he gave one drachm three or four times a day, in half a pint of warm water, in the state of effervescence, with tartaric or citric acid. If this fail to move the bowels freely by the second or third day, he gave salts or the infusion of senna to quicken its operation. As the strength of this preparation must depend much on the manner in which the colchicum is dried, and as, moreover, its active powers are much weakened by this process, it is evident that the remedy must be liable to great variations of strength. Professor Chelius states that, while patients affected with gout or rheumatism, make use of colchicum, a very remarkable increase of lithic acid takes place in the urine, and he attributes to this circumstance the great benefits which it produces in these affections.

With regard to the employment of colchicum with a view to its diuretic operation, late experience does not appear to speak much in its favor. By Baron Stœrck, however, it was regarded as a very powerful diuretic, and exceedingly useful in dropsy. Having ascertained, by experiments on himself, that the oxymel of colchicum, taken in doses of a teaspoonful, produced copious discharges of urine, he made trial of this remedy "in the hospital at Vienna, in desperate hydropic and other serous disorders, in which it was always found to act without disturbance as a most potent diuretic, after the common medicines employed with that intention had failed." He commenced with a drachm twice a day, and gradually increased the dose to an ounce, and occasionally an ounce and a half a day. I have seen it employed in one case of dropsy only, and in this instance it excited copious diuresis, without, however, effectually removing the disease.

This remedy has also been recommended in humoral asthma; of its powers in this disease, however, there is nothing extant, so far as I can ascertain, which is calculated to attract the attention of the profession.

Chelius states that he has employed this article with signal advantage in rheumatic ophthalmia, and in articular dropsies. He has also derived great benefit from its use in prosophagia,

* Practical Observations on the Colchicum Autumnale, as a general remedy of great power in the treatment of Inflammatory Diseases, both Acute and Chronic, &c., by Charles T. Haden, surgeon: 1820.

and in paralysis of the inferior extremities produced by an arthritic cause.

Within the last year, the seeds of the colchicum autumnale have been introduced to the attention of the profession, as a remedy of extraordinary powers in the cure of chronic rheumatism, and greatly superior, in every respect, to the root of this plant. Dr. W. H. Williams, of Ipswich, in England, to whom the credit is due of having first brought before the profession the remedial properties of the seed, says: "Much as the powers of the root of this plant have been extolled by different writers, I cannot omit this opportunity of declaring my decided conviction, that, however successfully different preparations of it may have been occasionally administered, its uncertain effects, the violence sometimes accompanying its operation, the little reliance to be placed upon the experiments hitherto made to ascertain the exact period of the perfection of the bulb, and the deterioration it frequently undergoes in keeping, are objections so weighty, that its value in the materia medica is insignificant compared with the immense advantages attending the exhibition of the seeds." He states that he exhibited the vinum seminum colchici* to a great many patients, some of whom were severely afflicted with chronic rheumatism, and he declares that he was astonished by the rapidity with which the pains were removed and the use of the limbs restored. He directs it to be given two or three hours after breakfast, and repeated at bed-time. "With respect, more especially, to the vinum seminum colchici," he says, "of the safety of which I have experienced much abundant proof, I cannot contemplate an extensive use of it in many painful diseases, besides chronic rheumatism, without entertaining the hope and belief that we have at length found the happy desideratum; a powerful, yet mild medicine, capable of substituting calmness, tranquillity and balmy sleep, in the place of pain, weariness and restless nights—a renovation of long lost limbs, and comparatively robust health, in lieu of feebleness and emaciation."† I fear,

* ℞.—Sem. colch. autumn. siccat. ʒii;
Vini Hispanici (Sherry, Angl.) Ocan. i.
Digere per dies octo vel decem, subinde agitando, dein per chartam cola, et in vasi probé clauso usui serva. Dose, ʒi twice a day, gradually increased to ʒiii. Dr. Williams states that "the acidum aceticum and the spiritus ammoniæ aromaticus imbibe the powers of the seeds in the same proportion as sherry; that an abundant aqueous extract may be obtained from the seeds, but no oil, and the water distilled from them appears totally inactive."

† Observations, with Cases illustrative of the Salutary Powers of the Seed of Colchicum Autumnale, &c. &c., by William Henry Williams, M. D., F. L. S. See London Medical Repository for August 1820, and June 1821.

however, that this flattering account of the sanative virtues of our remedy will not be verified to the full extent. There can, nevertheless, be no doubt, from the statements we have had, that it possesses very active powers; and although it is not probably entitled to the high encomiums bestowed upon it, there are just grounds to expect from it very important remedial results.

The flowers, also, possess the peculiar medicinal virtues of the seed and bulb. It has, indeed, been asserted, that the flowers furnish the mildest and most efficacious preparations of this plant. The editor of the London Medical Repository states that, "from the experiments which he has made, he was entirely satisfied that the *eau medicinale* is nothing else than a tincture prepared of the flowers of colchicum."

Dr. Paris thinks "that acids and oxygenating substances render the vinous infusion drastic; on the contrary, alkalies render its principles more soluble, and its operation more mild, but not less efficacious." The saturated vinous tincture is given in the dose of from a half to one drachm.

Mr. Richard Battley, chemist, of London, who appears to have paid very particular attention to the nature and properties of this root, and the best times for taking it, says, "that this root is deprived of its power, progressively, from the time of throwing out the new bulb until its final disappearance; and that, although very little change of appearance occurs during the winter months, it really undergoes a decided change during that period; that August, before the new bulb is thrown out, is the proper season to procure the root; and that the various opinions, as to the medicinal properties of colchicum, have proceeded from the various states in which it has been brought into use.

"The root, when dug up in August, should be immediately cut into transverse slices, equal in thickness to half a crown; to be then exposed, in wicker baskets, without placing the pieces in contact, to a temperature of 170° to 180°, and so to remain until dried, which will require from two to three hours."*

NICOTIANA TABACUM.

Tobacco possesses very considerable diuretic properties, but on account of its extremely unpleasant and sickening effects, it is seldom employed as an internal remedy. Dr. Fowler, who has written a work on the employment of this remedy in dropsy and dysury, speaks very highly of its efficacy in these diseases. He recommends it to be used in the form of an infusion; and observes

* London Medical Repository for July 1820.

that the best time for administering it is about two hours before dinner, and on going to bed. Dr. Ferriar also employed it in some cases with success; though he does not speak of it as deserving much confidence. He gave it occasionally in combination with other diuretics,* giving at the same time purging doses of cream of tartar in the morning. He states that he succeeded in several very unfavorable cases by this plan of treatment, and he thinks "that the action of the kidneys may in general be excited in this manner." I have employed the tincture of tobacco in two cases of dropsy, and although considerable diuresis was produced, no permanent advantage was gained. Tobacco has also been recommended in nephritis calculosa, and of late by Mr. Earle, in retention of urine from stricture. Under the head of narcotics, I have already spoken of its employment in this way; to which the reader is referred for a particular account of its various remedial powers.

LYTTA VESICATORIA.

Under the head of Epispastics, I have given a particular account of the chemical character and of the external employment of cantharides, and shall therefore confine myself, in the present place, to a consideration of its powers as an internal remedy. Cantharides are a very ancient article of the materia medica. Hippocrates speak of their internal employment in dropsy and amenorrhœa, and they are particularly mentioned in the writings of Dioscorides, Galen and Pliny.

When taken internally, in an excessive dose, cantharides occasion a burning sensation in the fauces, throat and stomach, producing inflammation of the intestines, and frequently blisters of the mouth and œsophagus. The heart and arteries are greatly excited, the pulse becoming full and hard, and the skin hot, as in inflammatory fever; the thirst is excessive and unquenchable; great anxiety is experienced, attended with retching, vomiting, diarrhœa, pains in the bowels, back and joints, itching of the skin, vertigo and syncope. But the most distressing and prominent operation of this article is its action upon the urinary organs. It produces, when taken in an over-dose, inflammation of the neck of the bladder and urethra, occasioning thereby the most

* ℞.—Oxymel colchic.,
——— scillæ,
Tinct. nicotian.,
Spi. æther. nitros, āā p. æ. Misce, capeat cochleare parvulum ex aquæ pauxillo quater in die.

painful dysury; the urine comes off drop by drop, being generally mixed with blood, and attended with excruciating pain; sometimes an entire suppression of it takes place, accompanied with the most distressing efforts to micturate. These symptoms are generally accompanied by the most tormenting erections. These are the effects of the medicine when exhibited in exorbitant doses; when employed in small ones, instead of producing difficult and painful discharges of urine or its total suppression, it excites a copious diuresis, and may often be very usefully employed where the evacuation is to be promoted. Cantharides have been recommended as a very useful remedy in typhus and malignant fevers. Home administered the tincture with wine whey; and Ettmuller states that he has often derived important advantage from the use of this tincture in malignant nervous fevers. Reil, also, speaks very favorably of the employment of this remedy in fevers, attended with torpor and prostration; and Jahn (Mat. Med., vol. i. p. 500,) asserts that he has administered it, in conjunction with camphor and calomel, with signal advantage in malignant fevers.

In cases of dropsy attended with a weak and languid circulation, cantharides will frequently produce very good effects. It appears to be more especially useful in those cases of anasarcous effusions which sometimes supervene in persons recovering from scarlatina and other acute fevers. Dr. Ferriar reports some cases of this kind which speedily yielded to the conjoint employment of bark and tincture of cantharides. In anasarca, attended with a sluggish state of the circulation, Bucholz employed a mixture composed of two drachms of antimonial wine and half a drachm of tinct. cantharides, with the happiest effect. Hufeland also administered this mixture in similar cases with decided benefit.

Cantharides have been recommended as particularly serviceable in hydrothorax, accompanied with a relaxed habit of body. They are also mentioned by some writers as serviceable in humoral asthma, and in other chronic affections of the breast. Burdach says that cantharides, in union with bark or opium or ether, are very serviceable in chin-cough, after it has already continued for a considerable time, and is attended with considerable atony of the general system. It should be given so as to excite slight pain in passing urine.

From what I have seen in my own practice, I am strongly inclined to believe that cantharides may be usefully employed in incipient phthisis, when it occurs in young females of relaxed habits of body, and suffering from amenorrhœa. In the œdema which often accompanies suppression of menses* in young chlo-

* See what is said of this remedy in the chapter of Emmenagogues.

rotic females, I have found the tincture of cantharides, with bark, a most useful remedy. By this remedy we at once invigorate the general system, promote the action of the kidneys, and determine the circulation to the uterine vessels, and thereby frequently reinstate the catamenia, and with them health.

From their powerful tendency to act upon the urinary organs, cantharides have been much employed both for the cure of incontinence of urine and suppression of this discharge from torpor or paralysis of the bladder. Nothing, indeed, has as yet been discovered which is so effectual in the former of these affections as this remedy. Where the incontinence arises from a paralysis of the sphincter of the bladder, we in general derive essential advantage from cantharides, given to the extent of producing slight strangury. It is equally serviceable for that species of incontinence of urine which many young people experience during sleep. We thus not only strengthen the sphincter muscles of the bladder, but greatly increase the sensibility of the neck of this organ, as well as of the upper part of the urethra, in consequence of which these parts contract the moment the urine comes in contact and irritates them, and thereby prevent its escape. An excellent mode of employing cantharides for affections of this kind, is to apply them externally, in the form of plaster, to the sacrum.*

Cantharides were formerly a good deal employed in gonorrhœa and gleet. Of late they have again been particularly recommended in the latter affection and in leucorrhœa. In the second volume of the Edinburgh Medical and Surgical Journal, Dr. Robertson has published an interesting paper on the employment of cantharides in these diseases. In gleet I have derived the most satisfactory results from this remedy. It is necessary, however, to give it in doses sufficiently powerful to produce a considerable ardor urinæ, and this effect should be sustained for some time. I have been less successful with the remedy in fluor albus: though in some cases I have known it to produce unequivocal good effects.

"There is no article of the materia medica," says Dr. Hosack, "used in any individual disease, the value of which ought to be estimated more highly than lytta in cases of seminal weakness and impotency." The introduction of this remedy in cases of this kind, in the United States, is due to Dr. Francis, of New York. In a letter which I have lately received from him, he observes: "My experience of the remedial powers of the cantharides, and its perfect safety and innocence, when given to a great extent, is

* Of the Use of Blisters applied to the region of the Os Sacrum, in the Cure of Incontinence of Urine, &c., by Thos. Dickson, M. D. Medical Observat. and Inquir., art. xxvii. vol. ii.

such, that I administer it in doses of two or three drachms a day, and on some occasions have given it to the amount of one, two or three ounces in twenty-four hours. I have not yet failed in a single case of impotence, though I have had instances of this dreadful disease of four, five or six years' standing." Dr. Hosack mentions a remarkable case of this kind which came under the care of Dr. Francis and himself. It was induced by the mismanagement of a neglected syphilis, and the injudicious use of strong lead injections. The patient was reduced to such a state of mental anguish as to induce him to seek a termination from his wretchedness by self-destruction. "With this view he took nearly six ounces of the tincture of cantharides during the night. Yet no dangerous symptoms occurred: he admitted he felt a degree of warmth throughout his body to which he had been a stranger, and that his mind was less depressed than before the commission of this act of folly." He was now induced to take two drachms and a half of the tincture of cantharides three times a day in union with a dessertspoonful of the tincture of amara, and to use a generous diet. In the course of three weeks he was completely relieved; "his virile powers resumed their wonted vigor, nor has he to the slightest degree relapsed into his former state of weakness."* It appears from experience, says Dr. Robertson, that the quantity of lytta requisite to keep up the irritation in the urinary organs, is always proportionate to the "existing debility either of the general habit or of the generative organs." The use of cantharides in cases of this kind must not be soon relinquished if they should not immediately produce any obvious amendment. "Perseverance in the use of this remedy," says Dr. Hosack, "is a practical precept that must here be enforced. The extent to which it may be carried, would, unaided by experience, seem incredible. Cures have been effected within a few days; at other times, from peculiarity of condition, as many months or years have been required to accomplish the object in view."

Cantharides have also been recommended in cutaneous eruptions. Mr. Mead† and Dr. Carmichael mention their success in this respect. It does not appear, however, that the remedy possesses any particular powers in cases of this kind.

The strangury produced by cantharides is best obviated by copious draughts of bland liquids, such as flaxseed tea, gum Arabic water, decoctions of barley, melon seeds, &c.

The dose of cantharides in substance is from one to two grains. It is best given with opium or extract of hyoscyamus. From thirty to sixty drops of the tincture may be given.

* Appendix to Thomas's Practice, sixth edit. p. 1034.

† Medica Sacra, p. 24.

In cases of poisoning from cantharides, it has been recommended to exhibit large doses of sweet oil; but the experiments of Dr. Pallas and Orfila prove that this is an exceedingly improper remedy in accidents of this kind. According to the experiments of the latter, cantharides macerated in cold oil, will, when exhibited to dogs, kill them in a few minutes. This depends on the property which oil possesses of dissolving the active principle of cantharides.*

BALSAM COPAIBÆ.

The tree† which affords this resinous liquid, grows spontaneously at Guiana, Brazil, in the country around Tolu, and in the Spanish West Indies. Deep incisions are made in the trunk of the tree, from which the balsam flows in considerable abundance. When it first issues from the tree it is very liquid, and nearly colorless. On being kept, however, it acquires the consistence of oil, and assumes a pale golden color. Although susceptible of considerable inspissation, it never becomes solid. Its taste is aromatic, acrid and bitter; and its odor fragrant and peculiar. It is always transparent, whatever be the degree of its consistency.

By distillation with water it affords a very odorous-pale-colored essential oil, leaving an insipid resinous substance. The action of sulphuric acid on this balsam destroys its transparency, and gives it a very disagreeable odor.‡ In water it is quite insoluble; but alcohol, and the expressed and essential oils, dissolve it with facility. It forms white saponaceous compounds with the pure alkalies, soluble in water. The resin, when entirely deprived of the oil, is hard, brittle, transparent, of a greenish-brown color, and without taste or smell. When the resin and oil are mixed in proper proportions, they form a liquid identical with the original fluid balsam. If the balsam copaibæ be triturated with a sixteenth of its weight of magnesia, and suffered to stand, it gradually acquires a solid consistence. The oil by re-distillation becomes colorless, lighter than water, possessing the odor and taste of the copaibæ, and entirely freed from oxygen, since potassium placed in it is completely preserved from combustion or oxygenation.

Balsam copaiva is a stimulant diuretic, imparting to the urine a bitter taste and peculiar smell; in large doses it acts pretty

* Journal de Pharmacie, Nov. 1822.

† Copaifera Officinalis, Linn.

‡ Alibert, Elémens de Thérapeutique, tom. iii. p. 341.

powerfully as a cathartic, and in exorbitant doses, it sometimes produces "a sort of vibratory feeling in the brain, or causes a febrile anxiety, with a mental disturbance bordering on insanity."*

The first use of this remedy is sometimes followed by an eruption like the nettle-rash, especially when it disorders the stomach. It has seldom been employed simply with a view to its diuretic operation, although, in some diseases of the mucous linings of the urinary and genital organs, it is a remedy of unquestionable utility.

In the cure of gonorrhœa, the reputation of this substance has long been very considerable, and it seems, indeed, to be very well founded. Many practitioners depend almost exclusively on its employment in this disease, and my own experience, independent of the authority of others, leads me to place very great confidence in its powers. Dr. Armstrong, in his work on scarlet fever, makes some excellent observations on the mode of administering this remedy in virulent gonorrhœa. This article, he says, "has been so generally restricted to the advanced stages, that, so far as I know, there is only one writer who advises it, and that by a short paragraph, *in the inflammatory state.*" He recommends it as generally a speedy and effectual remedy "in the primary as well as in the last stage of gonorrhœa," and states that he derived his knowledge of the efficacy of its early use in this disease from Dr. Pearson Dawson, "who had prescribed it with great success for more than twelve years, in the very commencement of virulent gonorrhœa."† Dr. Armstrong gives it, at first, in doses of sixty drops, formed into an emulsion with sugar, mucilage and water; repeated every morning and evening. The dose must sometimes be increased to the amount of three, four, or five drachms in twenty-four hours. To be entirely effectual, the use of the copaiva should always be continued for a week or ten days after the discharge ceases. When there exists much ardor urinæ, the copaiva may be allowed to act pretty freely on the bowels. To restrain its purgative operation, where this becomes troublesome, some laudanum should be given with it.

The good effects of this remedy will be much promoted by an antiphlogistic regimen, rest and cleanliness. These remarks on the use of copaiva in gonorrhœa, are drawn from Dr. Armstrong's excellent account of his experience with this remedy. For several

* Dr. J. Armstrong.

† Dr. Chapman, in his Therapeutics, recommends precisely the same practice. He seems, however, not to have read what Dr. Armstrong had said on this subject; for he speaks of the practice here recommended as peculiar to himself, and does not refer to the work of Dr. Armstrong.

years past I have pursued this plan of treatment, and I am fully satisfied that it will in general be found much more effectual, and certainly less apt to produce injurious consequences, than the common practice of employing strong astringent injections. I have, however, frequently employed, conjointly with the copaiva, injections of very weak solutions of sugar of lead, especially towards the end of the disease; and it has appeared to me that the cure has been expedited and confirmed thereby.

In the gonorrhœa of females, the balsam copaiva is less useful than in males. This is easily accounted for, when we advert to the circumstance that, in the latter, the urine which becomes strongly impregnated with the balsam passes immediately over the diseased surface of the urethra, and thus acts in a manner like an injection on the affected parts. In the female, however, no such immediate local impression can take place, inasmuch as the vagina, and not the urethra, is the part principally affected. That the urine becomes medicated by the copaiva is beyond a doubt, both from the taste and odor which it acquires in persons who take it; nor do we see any reason to suppose that a medicated fluid passing along the urethra from the bladder outwards, should not be as effectual as if it passed from a syringe inwards.

Balsam copaiva has also been recommended as a very useful remedy in chronic inflammation of the bronchia, and similar affections. Dr. Armstrong considers it among the best remedies we possess in affections of this kind. "It seems," he observes, "in many cases to exert a specific influence over the mucous membrane of the trachea and its branches; it increases the flow of urine; it not unfrequently keeps the bowels regularly open, and sometimes it acts upon the skin, causing an itching or an eruption." I have employed this article in a few cases of what I considered chronic inflammation of the bronchia; but its effects were not such as to induce me to think a great deal of its powers in this way. Dr. Armstrong observes that the copaiva sometimes produces an itching or eruption of the skin, both of which frequently alleviate the cough very much. This remedy, combined with sulphur, was much employed by Morgagni in chronic pulmonary diseases, and Dr. Armstrong states, that he has often exhibited such a combination with manifest advantage.* This balsam has also been recommended as a useful remedy in chronic inflammation of the mucous membrane of the alimentary canal. In chronic diarrhœa I have known it to produce very excellent effects. When this disease depends on mere chronic inflammation, without ulceration of the mucous membrane of the colon, copaiba, administered in conjunction with small doses of opium, may be

* Armstrong on Pulmonary Consumption, p. 274, 2d edit.

regarded as among our most useful remedies. When employed in this complaint, the copaiba ought to be given in small doses. Richter recommends a mixture of equal parts of bals. copaiba, ol. terebinth. and ol. succin. rectificat. as an efficacious remedy for involuntary emission of semen during sleep. Thirty drops of this mixture are to be taken three times daily, and the dose gradually increased until it amounts to sixty drops.

To render it more pleasant, and less apt to offend the stomach, it may be very conveniently formed into a mixture with the yolk of egg, or mucilage and water.*

It is very frequently found in an adulterated state in the shops. M. Bucholz says that it is impure if it does not dissolve in a mixture of four parts of pure alcohol and one of rectified ether. Rape oil, says Dr. Paris, is often mixed with it, "in which case, if dropped into the water, the drops will not retain their spherical form, as they invariably will, if pure."

Formulæ.

℞.—Bals. copaib. ℥vi;
Vitel. ovar. No. ii;
Syrup. limonis ℥ii;
Aq. fontanæ ℥iv;
Aq. menthæ ℥i.—M. Dose, a tablespoonful three or four times daily.

℞.—Bals. copaib. ℥ss;
Extract. cicutæ ʒii;
Pulv. rad. rhæi ʒi;
Pulv. g. Arab. q. s.—M. Divide into three grain pills. Take from three to six four times daily.

PIPER CUBEBA.

This plant is a native of Java, the Philippine Islands, of Guinea, and the Isle of France, and furnishes the cubebs of commerce, an article which has lately attracted considerable attention as a remedy in certain diseases. The cubebs, which are the berries of the plant, are of a light brown color, wrinkled on the surface, about the size of black pepper, and furnished each with a slender pedicle. According to the analysis of Vauquelin, they contain: 1. A volatile oil, which is nearly solid. 2. Resin resembling that of balsam copaiva. 3. A portion of another and

* Bals. copaiv. ℥ss; spt. lavend. compt., spt. nit. dulc., āā ʒii; laud. ʒi; g. Arab. ʒii; aq. font. ℥iv.—M. Dose, a tablespoonful morning, noon and night.

colored resin. 4. A colored gummy matter. 5. An extractive principle, similar to that contained in leguminous plants. 6. Saline substances.*

The cubebs are a warm and aromatic stimulant. In some persons they are mildly aperient, but in others they produce a contrary effect. Taken in the dose of from one to two drachms, they are considerably diuretic, giving a deeper tinge and peculiar odor to the urine. Within a few years past this article has been highly recommended by some practitioners in the cure of gonorrhœa. Mr. Jeffreys, senior surgeon of St. George's and St. James' General Dispensary, London, has lately published the result of his experience with the cubebs in this disease, from which it appears that out of twenty-seven cases which were treated with this remedy, eighteen were cured, six relieved, and three failed.† In only three of the cases cured did the disease continue beyond the twelfth day. The majority of cases were well before the eighth day. Dr. Jeffreys thinks that this remedy is more decidedly beneficial in the more inflammatory form of the disease. He observes, also, that the good effects of the medicine commonly begin to show themselves within forty-eight hours after the exhibition of the first dose; and that in those cases which yield only partially to its influence, the disease is put in such a state as to dispose it to yield more readily to the balsam copaiva. Several other writers of respectability have published favorable reports of the effects of cubebs in gonorrhœa. I have myself employed it in perhaps a dozen cases, and have found it decidedly beneficial in some instances. The general result of my experience with it, however, does not lead me to regard it as superior, or even equal, to the pure balsam copaiva administered in large doses.

The cubebs have also been prescribed with advantage in leucorrhœa. Dr. Trail, of Liverpool, states that he has employed it in this disease, and that, in every instance, he has found it to mitigate the violence of the complaint, and in several cases to remove it entirely.

The cubebs may be given either in the form of powder or of tincture. The former is given in doses of from ℈i to ℈ii two or three times daily. From one to two or three drachms of the tincture‡ is given three or four times during twenty-four hours.

* Annals of Philosophy, for March 1822.

† Practical Observations on the Use of Cubebs, p. 64.

‡ The tincture may be made according to this formula:

℞.—Bacc. piper. cubeb. ℥iii;
Spiritus vini tenu. Oi;
Digere per dies septem, et cola.

CHIOCOCCA VEL CACINCA.—CAHINCA ROOT.

The plant which affords the cahinca root is a native of Brazil, and is said by A. Richard to be the chiococca racemosa of Linnæus. This root, as it occurs in commerce, consists of cylindrical pieces, from one to three feet in length, of the thickness of a quill, and of a reddish-brown color. They are composed of a thin whitish bark, covered externally with a brown cuticle, and of an internal ligneous portion, forming nearly the whole substance of the root. The external or cortical part is of a resinous character, having a disagreeable, bitter, and somewhat acrid and astringent taste. The internal ligneous portion is entirely tasteless. Mixed with the genuine root, other pieces "are sometimes found, derived either from the branches of the stem above ground, or from those which run along the ground and have taken root. They are distinguishable from the true root, by being straighter and more regular, and presenting a medullary canal in their centre. The taste, too, is much weaker, and they appear to be less active."

The medicinal virtues of the root appear to be entirely confined to its cortical portion. Both water and alcohol extract them completely. According to the analysis made by MM. Pelletier and Caventou, the cahinca contains: 1. A crystalizable substance, in which the bitter principle of the root resides. 2. A green fatty matter, of a nauseous odor. 3. A yellow coloring matter; and 4. A colored viscid substance. The crystalizable substance is said to possess the properties of an acid, and has hence been denominated *cahincic acid* by Pelletier and Caventou. This peculiar substance, which appears to contain all the active properties of the root, "is white, without smell, of a taste at first scarcely perceptible, but afterwards extremely bitter and slightly astringent: of difficult solubility in water, but readily soluble in alcohol: permanent in the air, and unaltered at the temperature of boiling water. It reddens vegetable blues, and unites with alkalies, but does not form crystalizable compounds. The form in which it exists in the root, is thought to be that of a sub-cahincate of lime." (U. States Dispensatory.)

The cahinca root is as yet but little known or employed as a medicine in this country. It possesses stimulant, diuretic, purgative and emetic powers. It was introduced to the notice of the European profession, in 1826, by M. Langsdorff, Russian Consul at Rio Janeiro, as a most efficacious remedy in dropsy. Since that time several accounts have been published both in Europe and in this country, of its successful employment in this disease. Its remedial powers, in this respect, have been particularly illustrated by M. Francois of Paris. He has employed it with speedy

and complete success in several very severe cases; and he declares his conviction, that it is superior to all other remedies we possess in hydropic affections. When given in full doses, it excites an increased flow of urine, and causes copious discharges from the bowels. I have employed it in two cases of ascites, with highly favorable results. The aqueous extract may be given in the quantity of from six to twenty grains. It may also be conveniently administered in the form of decoction.* The *cahincic acid* has lately been employed, and it is said to be much more certain and uniform in its operation than either the extract, decoction, or powdered root.

APIUM PETROSELINUM.

This, the common parsley of the gardens, possesses very considerable diuretic properties, and is much used, as such, in domestic practice. The root has an agreeable sweetish taste, and the whole plant is slightly pungent and aromatic. The root is considerably more diuretic than the other parts of the plant, as I have frequently had occasion to observe in my practice. Given in the form of decoction, it seldom fails to produce a very considerable increase of urine. I have employed it very advantageously in suppressions of urine, and particularly in the strangury which sometimes supervenes on the use of cantharides and turpentine. I have also known it to give considerable relief in nephritic affections, attended with painful micturition. I have commonly prescribed it together with the malva rotundifolia, or with watermelon seeds. These additions are especially suitable in cases of strangury. It in general lies easy on the stomach, and is by no means unpleasant to the taste.

DIOSMA CRENATA.—FOLIA.—BUCHU LEAVES.

This plant is a native of the southern extremity of Africa, and is particularly abundant at the Cape of Good Hope. It is a small evergreen shrub, seldom rising above three feet in height, furnished with a number of verticillated branches bearing lanceolate, crenate, and coriaceous leaves, dotted on their under surface. The flowers are large, white, consisting of a five-parted calix, and ten unequal petals. The fruit is a stellate capsule, containing a great number of black shining seeds.

* ℞.—Rad. cahincæ ℥ii;
Aq. bullient. ℔iss.—M. Boil down to ℥viii. Of this a tablespoonful is to be taken three or four times daily.

The leaves are the only part of the plant used for medicinal purposes. They are from three-quarters to an inch in length, about three or four lines broad, elliptical or lanceolate, and very finely notched at the edges. The upper surface is smooth, and of a green color; beneath they are much paler and punctated. In consistence they resemble the leaves of the uva ursi. They have a strong, diffusive, and somewhat aromatic odor, and a bitterish and warm taste, analogous to that of mint. According to Cadet de Gassicourt, the buchu leaves contain 6.65 parts of a light, brownish-yellow oil, 211.7 of gum, 51.7 of extractive, 11. of chlorophylle, and 22.51 of resin. Their virtues are readily and completely extracted both by water and alcohol.

The buchu leaves possess stimulant, diaphoretic and diuretic properties. Among the natives of the Cape of Good Hope, they have long been esteemed as a remedy of various and valuable powers. Within the last seven or eight years, they have been considerably employed in England and on the continent of Europe, and they have also recently attracted some attention in this country.

These leaves have a peculiar and very decided tendency to operate on the urinary organs, producing effects analogous to those caused by the uva ursi. In chronic inflammation of the mucous membrane of the bladder, they have been employed with the happiest effects. In a case of this kind, attended with a very copious discharge of mucus from the bladder, I derived decided advantage from the use of this remedy. It has also been administered with great benefit in chronic nephritic affections, in morbid sensibility and irritation of the neck of the bladder, in a disease of the prostate gland, and in retention or incontinence of urine, "from loss of tone in the parts concerned in the evacuation." From the accounts which have been published of the effects of this remedy in diseases of this kind, as well as from my own experience, I have been led to regard it as worthy of particular attention in the treatment of urinary affections.

The buchu leaves have also been recommended as an efficacious remedy in chronic rheumatism, in diseases of the skin, and in leucorrhœa. In the latter affection I have employed the saturated tincture, with very evident advantage.

From twenty to forty grains of the powder may be taken three times daily. The infusion, prepared of half an ounce of the leaves, with a pint of boiling water, may be administered in doses of from one to two fluidounces. Of the saturated tincture I have given a teaspoonful three times daily.

DAUCUS CAROTA.—WILD CARROT.

The wild carrot grows in very great abundance in many parts of the United States. In the vicinity of this city, particularly, it is one of the most common plants. The seeds of this species of carrot have a warm and moderately pungent taste, and a very agreeable aromatic odor. They are considerably diuretic, and are much used by the country people in suppressions of urine and painful micturition. In my own practice I have derived the most unequivocal advantage from an infusion of these seeds in anasarcous swellings of the lower extremities. They have also been employed with success in the other varieties of dropsy. In a consultation letter which I received from the late Dr. Wistar, in the case of the late Judge Yeates, of Lancaster, who labored under hydrothorax, the doctor observes: "The wild carrot seeds, in infusion, have also been sometimes successful in hydrothorax." They hardly ever fail to produce pretty copious diuresis; and an infusion of them may be drunk almost to any extent, without nauseating the stomach.

The common garden carrot is also applicable to useful medicinal purposes. When boiled and beaten into a pulp, it forms an excellent cataplasm to ill-conditioned ulcers. "A marmalade of carrots, on account of their strong antiseptic qualities, has been successfully used in preventing and curing the sea-scurvy. An infusion of these roots has also been found to afford considerable relief to persons afflicted with the stone and worms, but especially the tape worm. It may be given to the extent of a pint a day."*

This plant is figured in Barton's Med. Bot., vol. i.

ERIGERON HETEROPHYLLUM.

This plant is common to the United States and Europe; and is found in very great abundance in almost every part of this country. It rises to the height of two or three feet; the stems are roundish, striated, pubescent, and about the thickness below, of a pipe stem, gradually tapering towards the top, where it is divided into numerous spreading branches. The radical leaves are ovate, acute, deeply toothed, and supported by broad-winged petioles, half the length of the leaves. The stem leaves are sessile, lanceolate, acute, deeply sinuated or remotely serrate-toothed in the middle. The leaves of the branches are lanceolate, entire, and

* Thacher's Dispensatory.

closely sessile. All the leaves, except those from the root, are ciliated at and near the base. The flowers, borne in terminal, rarely lateral, corymbs, are numerous, "and of the sun-flower shape. The disk or centre is bright yellow," and the rayflorets capillary, numerous, white, blue, and sometimes pale purple. It flowers from August to late in the fall.*

This plant is well entitled to attention for its powers as a diuretic and antilithic. In this city it has been a good deal employed, within a few years past, in nephritic and gravelly affections. Dr. Physick employed it in a case of dysury, attended with great pain and irritability of the bladder, with much relief to the patient. Dr. Wistar, in a letter to me, some years ago, says, "I once attended a gentleman who suffered with gout and hydrothorax; the squill produced great disturbance and pain of the stomach, and thus did more harm than good. This gentleman was greatly relieved by the infusion of scabius, which he took very freely." In another letter, already referred to in the preceding article, he says: "The infusion of scabius, taken plentifully, once gave complete relief in a similar case, (hydrothorax, with gout,) but it has sometimes failed."

I have been much in the habit of prescribing this plant in gravelly and hydropic diseases. It has seldom failed to produce pretty copious diuresis in my practice, and the advantages derived from it have been such as to give me a very high opinion of its remedial powers. It will, in general, lie easy on the stomach, and has no tendency to weaken the digestive powers. Some of my patients have even found an increase of appetite from its use, and I do not recollect an instance where it became injurious to the stomach. "My own experience," says Dr. W. P. C. Barton, "with this plant, enables me to bear testimony to its diuretic virtues. If it be not among the most powerful medicines of this class, it has the estimable property of being innocent to the stomach. I have used a strong decoction of this plant in a case of nephritis, at the Naval Hospital, and my success in this instance far exceeded my most sanguine expectations, and emboldens me, with some degree of confidence, to recommend the scabius in similar cases."†

The plant should be collected when in flower. The best way of using it is in decoction, of which a pint or two may be taken in twenty-four hours. For excellent figures and prescriptions of the Erigeron Heterophyllum and E. Philadelphicum, see Dr. W. P. C. Barton's Vegetable Mat. Med., vol. i.

* Barton's Vegetable Mat. Med., vol. i. p. 232.

† Ibid., p 236.

CHIMAPHILA UMBELLATA.—WINTER GREEN.—PIPSISSEWA.

This plant is common throughout every part of the United States, growing in dry shady woods, and preserving its verdure during the winter season. The root is perennial, creeping, and of a yellowish color. The stems are semi-procumbent, hard and woody at the base, from six to eight inches high, "and marked with the scars of the former leaves." The leaves generally grow in whorls, opposite or scattered, subsessile, lanceolate, somewhat wedge-shaped, acutely serrate, decurrent on the petiole, coriaceous, and of a deep shining green color. The flowers appear in June and July, in a sort of umbel, variegated with purple and white. When chewed it imparts an aromatic pungency to the taste, and when bruised it has a strong and unpleasant smell.

This vegetable has been but recently introduced into regular practice, and from the accounts which have already been published of its efficacy in various diseases, it would appear to be entitled to much credit. Schœf speaks of it as "astringent and corroborant," but says nothing of its diuretic qualities. During the American revolutionary war, it was employed as a tonic remedy in typhus fever. It was formerly a good deal used in some parts of the United States as a domestic remedy for rheumatism. Of late it has been introduced to the particular notice of the profession as a valuable diuretic medicine. Dr. Summerville, of the British army, deputy inspector of the military hospitals in Canada, in a paper published a few years ago, adduces some interesting facts demonstrative of its good effects in dropsical diseases. He states that the diuretic effects of a strong infusion of this herb were always very considerable, and that one patient to whom he gave it experienced an agreeable sensation in the stomach soon after taking the medicine, and a very considerable increase of appetite. He states, also, that Sir Walter Farquhar employed this remedy in the case of a lady laboring under abdominal dropsy, in which the diuretic effects of the medicine were very strikingly manifested. Dr. Marcet, in consequence of Dr. Sommerville's paper, tried the extract of this plant at Guy's Hospital, in doses of fifteen grains, with manifest advantage. Other writers speak favorably of this remedy as a diuretic. In my own practice I have employed it in one case only, and, although it evidently produced a considerable increase of urine, it did not afford any decided advantage.

The bruised leaves will sometimes produce redness, vesication, and desquamation, when applied to the skin.*

* Barton's Collections towards an Essay on the Materia Medica, third edit., part ii. p. 21.

The pipsissewa has also been successfully employed in the cure of intermittents. Dr. Mitchell* relates several cases of this complaint which were effectually removed by the use of this remedy. It has also been recommended as an excellent antilithic. The late Dr. Barton says, that "all his trials and inquiries respecting this plant have convinced him that it is an important antilithic, not less so than the uva ursi." I have used it in some cases of this kind, but did not derive any particular advantage from it. I suspect that its antilithic powers are entitled to very little attention.

This vegetable has of late been a good deal employed in cancerous affections, and some very remarkable cases are published in testimony of its good effects in this way. Although I am perfectly satisfied of its total inutility in cases of this kind, I have, nevertheless, in several instances, known its internal employment to produce excellent effects in the cure of ill-conditioned ulcers and venereal eruptions. It may be given in the form of a strong decoction, to the extent of a pint in twenty-four hours. The watery extract of this plant has also been employed to the extent of five scruples in twenty-four hours.

SUBCARBONAS POTASSÆ †—KALI PRÆPARATUM.

Both the carbonate and subcarbonate of potash occasionally manifest considerable diuretic powers. Upon the subject of the modus operandi of the saline diuretics, Dr. Cullen observes: "With respect to the whole of them, it is to be observed, in the first place, that as it seems to be determined, by the nature of the animal economy, that all saline substances received into the mass of blood should soon pass out again by the excretions, and particularly by that of urine, it will be obvious that, as all saline matters are more or less stimulant, they must all of them, in passing by the kidneys, be more or less diuretic." From the re-appearance of these salts in the urine, after having been taken into the stomach, there can hardly be a doubt of the correctness of this explanation of their modus operandi in producing diuresis. This is rendered still more probable by the fact that, when they prove laxative, and are thereby prevented from being absorbed, by the rapidity with which they are carried out of the body through the alimentary canal, they produce little or no diuretic effect. To

* Inaugural Dissertation on the Medical Properties of the Pyrola Umbellata, Phila. 1803.

† The chemical history of this article has already been given in the chapter of Antacids.

obtain the full diuretic operation of the neutral salts, it is therefore necessary to exhibit them in such small doses as to prevent them from acting on the bowels as a purgative, and they must be repeated at short and regular intervals.

The diuretic effect of the fixed alkali is said to be enhanced by combining it with bitters, as was the custom of Sir John Pringle. Dr. Cullen observes that, by giving the alkali in this way, he "commonly found it to prove diuretic." He also adds, that "alkalies may be often prevented, by purging, from reaching the kidneys; and that their diuretic effect may be often more certainly secured by giving an opiate at the same time." Dr. Mead was in the habit of using such a combination, and he represents the practice as a very useful one. Formerly the carbonate of potash was much employed in the cure of dropsy. We find it recommended in the works of Drs. Ettmuller, Willis, Sydenham, Monro, Mead, Mascagni, and other writers of the early and middle periods of the last century, as an efficacious remedy in this disease. Monro speaks particularly in praise of it, when given in combination with rhubarb. "In the cure of those dropsical patients whose constitutions are so weak that they cannot bear purging, it is to be attempted," says Sydenham, "by diuretics: those are the best which are made of the lixivial salts."

I have employed the carbonate of potash in combination with squills, in persons laboring under hydrothorax, attended with indigestion and acid in the stomach; it is obvious that, in cases of this kind, such a combination is especially indicated, and in a few instances in which I have tried it, I have had much reason to be pleased with its effects. Dose from gr. x to ʒss.

ACETAS POTASSÆ.—SAL DIURETICUS.—TERRA FOLIATA TARTARI.

This salt is obtained in foliated laminar masses; it is extremely deliquescent, and possesses a sharp and pungent taste. One ounce of water at 60° dissolves four hundred and four grains. Four parts of alcohol by weight, will dissolve one part of the salt. It consists of forty-five parts of potass and forty-eight of acetic acid. "It is decomposed by tamarinds and most sub-acid fruits; by almost every acid as well as every variety of neutral salt, whether alkaline, acid, or metallic."

This article was formerly much employed as a diuretic, though at present its reputation as such does not appear to be very great. In combination with other diuretics, it is, however, still frequently prescribed; and I have myself, in some instances, used it with evident advantage in the way recommended by Dr. Maclean in

his work on hydrothorax.* Alibert, however, speaks of it as a very efficacious diuretic in dropsy. "This remedy," says he, "is so well suited to the sensibility of the absorbents that its administration is frequently followed by very salutary effects." He mentions a case of anasarca that was effectually cured by this remedy alone, after many other diuretics had been long tried in vain.† He observes that he might cite many other cases treated in the Hospital Saint Louis, which show the remedial "powers of this valuable medicine."

It cannot be given in powder or pills on accounnt of its extreme deliquescence. The dose is from ℈i to ʒi; in the dose of from ʒiii to ʒiv it proves mildly cathartic.

NITRAS POTASSÆ.—NITRE.—SALTPETRE.

In another place the chemical history of this salt is fully detailed, together with the various medicinal powers which it possesses independently of its diuretic operation. As a diuretic, nitre is not very powerful. It may, nevertheless, be advantageously employed, either alone, or conjointly with other diuretics, in dropsical affections; particularly in cases attended by much arterial excitement, where it produces the twofold advantage of diuresis and a reduction of the action of the heart and arteries. Alibert observes, that when given with a view to its diuretic effects, it should be administered in copious draughts of some mild liquid. When exhibited in this way, it is much more active as a diuretic, than when given in substance. The dose, as a diuretic, is from gr. x to gr. xv. In exorbitant doses, it excites vomiting, spasms, convulsions, bloody stools, and even death.

SUPER-TARTRAS POTASSÆ.—CREAM OF TARTAR.

I shall not repeat here what I have already said respecting the chemical character of this remedy. Possessing both hydragogue and diuretic properties, the cream of tartar would seem to be peculiarly suited to the treatment of hydropic diseases. By many, indeed, it is considered as one of our most efficacious remedies in such affections. When given in a large dose, it acts

* ℞.—Bacc. juniper. contus. ʒii; infunde in aq. ferv. ℔ii per horas aliquot. dein cola. colatur. adde kali acetat. ʒss; spir. junip. c. ʒii.—M. This is to be used in draughts of about a gill, three times a day, as an adjuvant to a more active diuretic mixture composed of nitre, squills and calomel.

† Elémens des Thérapeutiques, vol. i. p. 327.

upon the bowels, producing copious watery stools; and, at the same time, excites the kidneys to an abundant secretion of urine. By this combined operation upon the kidneys and bowels, the remedy often evinces a powerful control over dropsical accumulations. To increase its diuretic effects, it may be advantageously given in union with digitalis, as was practised by Dr. Ferriar. This accomplished writer observes, in those cases in which he employed the cream of tartar successfully, it operated very early, "producing an increased flow of urine within twenty-four hours. It commonly diminishes the swellings very speedily, and for the greater part, lessens the patient's size more quickly than the increase of urine would lead us to expect." It is quite evident, indeed, that the power of this remedy, in evacuating dropsical accumulations, does not depend exclusively on its property of exciting the renal emunctories, but in a considerable degree, also, on its power to increase the action of the intestinal exhalants. Cream of tartar is apt, by frequent repetition, to weaken the digestive organs; to obviate this effect, cordials and tonics ought to be employed along with it. In doses of four to six drachms, it acts as a hydragogue: in smaller ones, it acts simply as a diuretic. To increase its diuretic operation, it should be given in solution. One drachm of the cream of tartar to a pint of boiling water, and flavored with lemon-peel and sugar, forms an excellent and cooling diuretic drink.

SPIRITUS ÆTHERIS NITROSI.

The dulcified spirits of nitre is a colorless fluid, extremely fragrant, and of a pungent acidulous taste. It consists of a portion of nitric ether and nitric acid in union with alcohol. "With the green sulphate of iron it strikes a deep olive color, and with the tinctures of guaiacum it produces a green or blue coagulum."

Though by no means a very certain or active diuretic, the sweet spirits of nitre may sometimes be administered with much advantage, as an auxiliary remedy in dropsy.*

It is not, however, often employed in dropsy, and is certainly, perhaps, never to be depended on as a principal remedy in this disease. In the diseases of children, it is a very common remedy, and as it possesses considerable diaphorectic powers, it may be very usefully employed, not only in diseases of the urinary organs, but also as a general remedy in febrile cases. As an anti-

* Dr. Paris gives this formula, as a highly stimulating diuretic:

℞.—Tinct. lyttæ M. x; spirit. ætheris nitrici ʒi; misturæ camphoræ ʒxii; syrup. zingiberis ʒi. Fiat haustus, ter in die sumendus.

phlogistic in febrile diseases attended with a dry and hot skin, the sweet spirits of nitre often produces very excellent effects. It appears, indeed, to produce sedative effects, independent of the evacuations which it excites. When given in large and repeated doses, it seldom fails to reduce the action of the heart and arteries, and to moderate the febrile heat of the skin. From its pleasant taste it can in general be easily given to children. When administered as a diuretic, it should be given in large doses, not less than three drachms at once to an adult. In doses of ten to thirty drops it acts as a gentle diaphoretic.

TINCTURA MURIATIS FERRI.

The muriated tincture of iron possesses considerable diuretic powers. It has been especially recommended in suppressions of urine depending on spasm. Given in doses of ten or twelve drops every ten or fifteen minutes, it sometimes procures prompt relief in the most obstinate cases of this kind. "To the good effects of this medicine," says Dr. Thomas, "I can myself bear testimony, having tried it in some cases of spasmodic suppression with success. After six doses the urine usually flows easily." In a case of chronic dysury, attended frequently with discharges of bloody urine, and a constant feeling of uneasiness or soreness about the neck of the bladder, I prescribed this remedy with decided and permanent advantage, after a very great variety of medicines and modes of treatment had been employed with but temporary benefit. In chronic inflammation of the mucous membrane of the bladder, this tincture has been used with decided benefit. I have employed it with unequivocal advantage in several cases of chronic catarrh of the bladder. In cases of this kind, it should be given with a considerable quantity of some mucilaginous fluid, such as flaxseed tea, infusion of slippery elm bark, &c. In a letter which I lately received from my friend Dr. Francis, of New York, he observes, "the muriated tincture of iron is acknowledged by all as a valuable diuretic. But in cases where there is much local irritation, as in some affections of the prostate gland, and in disorders about the neck of the bladder, its action is, at times, excessively painful. Under such circumstances," he continues, "I have found the muriated tincture of gold preferable. Indeed the gold deserves far more notice as a diuretic than as an antivenereal remedy."

CHAPTER XV.

IODIUM.—IODINE.

This substance was discovered in 1812, by M. Courtois, while engaged in the manufacture of soda from sea weeds. It exists naturally in various marine productions, particularly in the fuci, the sponge, certain polypi, and the oyster. It may, also, be obtained in minute quantities from sea water and from certain salt springs. Dr. William Usher discovered it in the water of the Congress spring at Saratoga; and small quantities have been obtained from the Kenhawa saline waters. "When in solution, iodine always occurs in union with hydrogen and a base, forming a *hydriodate.* In sea weeds it appears to exist in the state of a hydriodate of potassa, and it is from the ashes of these that the iodine is most readily obtained."

Iodine consists of soft, friable, opake crystaline scales, of a dark color, and somewhat metallic lustre. It has a strong odor analogous to that of chlorine, and a very acrid taste. It melts at a temperature of 225° and boils at 347°. When exposed to a moderate degree of heat, it is speedily converted into a vapor, of a rich purple color. Iodine dissolves in 7000 times its weight of water, and in a much smaller quantity of alcohol or ether. The alcoholic solution is acrid, and of a fine dark red color; with ether it forms a deep brown solution. Iodine combines with nearly all the metallic, and with many of the non-metallic substances forming *iodides.* With oxygen it forms *iodous* and *iodic acid;* and with hydrogen, a gaseous compound called *hydriodic acid.*

Iodine may be readily detected by starch, with which it forms an insoluble compound of a deep blue color. This test is so delicate, that "it will indicate the presence of iodine contained in 450,000 times its weight of water. In order that this test may succeed, the iodine must be in a free state, and the solutions cold. To render it free, when it happens to be in saline combination, a little nitric acid must be added to the solution suspected to contain it.

Iodine is a powerful and valuable medicinal agent. Although very extensive in its influence on the animal system, its action

appears to be especially directed on the *absorbent* or *lymphatic* system. Coindet says, that his experience with this article upon more than two hundred patients, has convinced him, that "it is one of the most energetic excitants of the lymphatic system with which we are acquainted." It operates also as a general stimulant on the sanguiferous system, and manifestly influences, in no inconsiderable degree, the action of the *secernants*, "or those vessels whose function it is to deposit and reproduce." Its action on the heart and arteries, however, appears to be very much under the influence of constitutional habit or physical temperament. In nervous and irritable subjects, even moderate doses generally produce considerable arterial excitement; whilst in lymphatic and torpid habits, ordinary doses rarely produce this effect. Administered in minute doses, iodine frequently manifests decided *tonic* powers, giving tone to the stomach and exciting the appetite. It is also said to possess considerable *emmenagogue* powers. Coindet declares that, "if given in a certain dose and continued for some time, it is one of the most active emmenagogues we possess." Its powers in this respect, however, are by no means such as is asserted by Coindet. It may, indeed, sometimes restore the suppressed menstrual secretion, but its effects in this way are uncertain, and doubtless depend more on its general influence on the system than on any direct or specific tendency to operate on the uterus. Brera observes "that, like mercury, iodine maintains a permanent action on the system, for a considerable time after its administration has been suspended. It powerfully excites the nervous system, accelerates the action of the heart and arteries, and restores the healthy functions of the sanguiferous and glandular systems. It improves the appetite, fattens the lean and emaciates the corpulent, and, directing its action particularly on the thyroid gland and *uterus*, it removes the enlargements of the former and promotes scanty, and lessens excessive menstruation."

Although an article of valuable remedial powers, and, under judicious management, generally free from all unpleasant effects, yet, like all other energetic medicinal agents, iodine, when administered in excessive doses, and in certain physiological states of the system, is apt to produce very distressing and alarming consequences. The effects which often result from its injudicious use are: "highly accelerated pulse, palpitation, frequent dry cough, insomnia, great loss of strength and emaciation, swelling and tremors of the lower extremities, wasting of the mammæ, and a continued and annoying increase of appetite." (Coindet.) Certain individuals can never take it in doses sufficient to affect the constitution, without very unpleasant consequences; such as "dimness of vision, indistinct hearing, fallacious touch, palpitation

and various other nervous symptoms." (Gairdner.) Dr. Gairdner states that in a case in which the use of this remedy was pushed too far, it gave rise to "gnawing pains at the stomach, great anxiety and oppression, emaciation, frequent vomiting, severe pains in the abdomen, with the most distressing thirst, and finally violent cramps and convulsive action of the muscles of the arms, back and legs, without scarcely any intermission."

In some individuals iodine produces a peculiar itching or tingling sensation over the whole surface of the body, and its external application, in the form of an ointment, is said sometimes to cause a "total loss of sensation in that part of the integuments on which it is rubbed, extending itself occasionally to those parts which are supplied by the same nerves of sensation." The tendency of iodine, when its use is long continued, to cause wasting of the mammæ has already been mentioned. I have witnessed one remarkable instance of this kind. Cases have also been related in which the protracted employment of this remedy was attended with the almost entire, and even total absorption of the testicles.

Although violent and dangerous effects may result from the careless or improper use of this article, it is, nevertheless, a remedy of important medicinal powers, and, under due circumspection and judicious management, may be employed without the least risk of dangerous consequences. Dr. Manson asserts that he administered it "in several hundred cases, without ever having cause for disapproving of it;" and Dr. Roots, an English physician, says, that he used it in more than three hundred cases, without any injurious effects. We may also refer to the experience of Drs. Coindet, Gairdner, Baron, Decarro, and Brera, all of whom employed this remedy extensively without having, in any instance, witnessed injurious consequences to result from its operation. M. Zink states, "that as soon as the tincture of iodine became known as a cure for goitre, it was used to an enormous extent at Lausanne; it was pushed so far, that I may say, without exaggeration, the tincture of iodine bottle occupied the place of the *bonbonnière*, for I have seen persons carrying it about with them. With few exceptions it was in general use; some took it to prevent this dreadful affection. This medicine was procured at the shops without physician's prescription. This mania for iodine had some victims; but in general, much less mischief was done than might be expected from the incautious manner in which the tincture was used." (Magendie's Formulary, p. 62, sixth ed.)

Iodine was first employed as a remedial agent, in the year 1819, by Dr. Coindet, of Geneva. Reflecting on the fact that *goitre* had frequently disappeared under the internal employment of burnt sponge, and that the *fucus vesiculosus* had recently been used with equal benefit in this disease; and knowing that the

latter vegetable contains a considerable portion of iodine, he concluded, that as sponge was also a marine plant, iodine was, probably, the active remedial principle in both these marine productions, and that it might be very efficiently employed in its pure and separate state. This conjecture was soon fully confirmed by experience; and this substance is now universally acknowledged as a remedy of extraordinary efficacy in goitre. It has seldom been employed, even in the most inveterate and violent cases of this malady, without manifest benefit, and in a vast majority of the instances in which it has been used, the disease has gradually and completely disappeared under its influence. In scrofula, also, iodine is a remedy of valuable powers. It is particularly beneficial in discussing or removing scrofulous indurations. For this purpose it is generally employed externally, by rubbing the ointment several times daily into the enlarged lymphatic gland. In enlargement of the mammary glands of a scrofulous character, iodine has been used with the happiest effect. Dr. Gairdner states that a case of strumous enlargement of the right breast, which had existed for two years, was entirely cured in six weeks, by rubbing the ung. potass. hydriod. into the axilla of the affected side every night on going to bed. Dr. Coindet also asserts that he has repeatedly resorted to this remedy with entire success in "indolent enlargement of the glands of the breast, consequent upon delivery." Bayle (Rev. Médicale, Aug. 1828) relates several cases of enlarged mammæ which yielded to the internal and external employment of iodine; one of these cases was of eighteen years' standing.

In enlargements of the liver and spleen, iodine has shown itself a valuable remedy. Dr. Thompson, of Louisiana, employed it with complete success in six cases of indurated enlargement of the spleen; and Dr. Cartwright, of Natchez, asserts that he used it in cases of this kind with the happiest effect. I have myself resorted to the use of this remedy in two inveterate cases of indurated and enlarged spleen, with entire success. This remedy has, moreover, been successfully used in chronic enlargement of the testicles. Dr. Brown, of Ohio, has related a severe and obstinate case of this kind, which yielded entirely to the influence of the iodine. (Western Jour. Med. and Phys. Sciences, No. 3.)

Dr. Gairdner states that he has employed this remedy with very decided benefit in marasmus, or strumous disease of the mesenteric glands. M. Calloway also resorted to it in this affection, with the most satisfactory results. It is asserted by some writers, that iodine has been employed with entire success in *scirrhous cancers*. That it has been used with unequivocal advantage in this formidable affection, is too well attested to admit of doubt. Græfe, of Berlin, has related a case of *cutaneous cancer* on the

left breast in a female fifty years of age, which yielded entirely to frictions with the ungt. potass. hydriod. (Græfe and Walther's Jour.) In *carcinoma uteri*, also, very decided benefit has been obtained from the use of this remedy. Hufeland employed it in cases of this kind with great advantage; and he states that Dr. Hahnemann prescribed it in a case which had advanced to the last stage, and in which there was a communication between the vagina and cavity of the abdomen, with surprising advantage.

In certain affections of the nervous system, very decided benefit has been derived from the use of this article. Dr. Manson informs us that he has employed it in all the different varieties of palsy with the most satisfactory results. Dr. Brown, of Ohio, used it with complete success in a case of paraplegia. It has also been successfully administered in *chorea;* but its efficacy in this affection does not appear to be remarkable. Out of seventy-two cases, in which Dr. Mason employed the remedy, eleven only were cured.

Iodine appears to be entitled to considerable attention as a remedy in gonorrhœa. M. Richond, in a memoir he has published on this subject, mentions a number of cases, which yielded to the influence of this remedy, after various other approved means had been ineffectually resorted to. Dr. Bell, of Philadelphia, has also used it in this complaint with satisfactory results. The iodine should not be resorted to, until the inflammatory symptoms of the disease are subdued. This remedy has likewise been successfully used in venereal bubo. M. Richond has related a number of cases, in which the iodine was employed with great advantage; and Drs. Cartwright and Bell prescribed it in cases of this kind, with very favorable results. Iodine would seem, moreover, to be beneficial in syphilis. Dr. Bell states that, "in ulcers of the mouth and throat, whether consecutive of syphilis, or proceeding from other causes, I have derived the very best effects from iodine."*

Both in amenorrhœa and dysmenorrhœa, iodine has been administered with unequivocal benefit. It has also been employed with complete success in chlorosis. Coindet informs us that, in the latter affection, he has prescribed this article with the happiest effect; and Dr. Bell administered it in amenorrhœa with entire success. Magendie states (*Formulary*) that he prescribed the iodine in a case of supposed amenorrhœa; in about three weeks abortion took place. In leucorrhœa, very decided benefit has been obtained from this remedy. Dr. Goeden used it with success in two cases of six years' duration;† and Dr. Bell asserts that

* Dr. Bell's paper on iodine. North Amer. Med. and Surg. Journ., No. 12.

† North Am. Med. and Surg. Jour., vol. ii. p. 412.

he administered it in several cases of this complaint with "speedy and permanently beneficial effects." Dr. Girnelle, also, declares that he has employed this article with peculiar satisfaction in inveterate cases of the malady. I have myself prescribed the iodine in a number of cases of leucorrhœa; and although in the majority of instances it failed to do much good, several cases of long standing were entirely cured by its use. In a case which occurred to me about six months ago, and which had continued in an aggravated form, for about ten years, the iodine has effected a cure, which I have reason to think will be permanent. The use of the iodine was continued for nearly three months.

Decided benefit has been derived from this remedy in hydropic affections. Dr. Baron, in his work on "Tuberculous Diseases," mentions a case of ovarian dropsy, in which great advantage was obtained from the use of iodine; and Dr. Gairdner declares that he witnessed an instance of this disease, which was completely cured by this remedy, after the tumor had been twice tapped. In a case of this affection which came under my care, about two years ago, frictions over the ovarian tumor with ungt. potass. hydriod., caused a very considerable reduction of its size. Iodine has also been used with much advantage in certain forms of cutaneous disease. Dr. Goeden used it with success in *tinea capitis;* and Dr. Mandon knew it to cure a case of *leprosy*. The iodine of sulphur is said to be particularly efficacious in affections of this kind. Dr. Biett employed it in psoriasis, tinea favosa, and *acne rosacea*, with remarkable success. He employed it externally in the form of an ointment, composed of one part of the iodide of sulphur, with sixteen, twenty, or twenty-five parts of lard.

Iodine is said to have manifested very decided remedial powers in *phthisis pulmonalis*. Dr. Baron mentions a case, in which the existence of tubercles in the lungs could not be doubted. Under the use of iodine, the consumptive symptoms gradually subsided, until the patient's health was completely restored. Dr. Gairdner also employed this remedy in phthisis pulmonalis, and in several cases, its effects were decidedly beneficial. It must be observed, however, that it is only in the early or incipient stage of the disease, that any advantage can be expected from the use of this remedy; and even when thus early resorted to, the chances of success must be regarded as very limited. M. Fermon employed the following mixture in a case of phthisis, with great benefit.* The *vapor* of iodine has also been employed in the

℞.—Lettuce water ℥iv; solution of hydriodate of potassa gtt. xv; medicinal Prussic acid gtt. x to xv; syrup of marshmallows ℥i.—Mix. Take a teaspoonful every hour.

treatment of this disease. Dr. Benton says that he has derived unequivocal advantage from the inhalation of iodine vapors in phthisis. The mode of using it is as follows: "In a bottle with two tubular openings, put some diluted sulphuric acid, and project on it, daily, about half a grain of hydriodate of potassa. The iodine is immediately disengaged in the form of vapor, and this may be inhaled by the patient through one of the tubes of the bottle. The inhalation must be repeated from four to ten times daily, the duration of each being from four to five minutes." The usefulness of iodine in scrofulous ophthalmia, has already been noticed. It would seem also worthy of attention, as a remedy in iritis, and in opacities of the cornea. Drs. Manson and Cartwright employed it in both these affections with great success. In scrofulous ophthalmia attended with opacity of the cornea, Dr. Cartwright applied the ungt. potass. hydriod. twice or thrice daily to the eyelids and adjacent parts, exhibiting, at the same time, the tincture of iodine internally. Great care should be taken that the ointment do not come in contact with the conjunctiva, as it would inevitably produce violent and painful irritation. Dr. Gendrin, of Paris, declares that he has used the iodine with extraordinary benefit in *gout* or *arthritis*. He found it especially efficacious in reducing the chronic enlargements of the joints, as well as articular concretions. He applied the iodine ointment to the affected joints by frictions, and, at the same time, exhibited the tincture internally. He asserts that in every case of gout in which this treatment was adopted, the patients were cured in a few days, or their condition rapidly meliorated.* Dr. Choate, of Salem, resorted to this mode of treatment in a very severe case of this affection, and the result was highly satisfactory.† Dr. Manson relates several cases of *white-swelling* or *fungus articuli*, in which the use of iodine was attended with the happiest effect. He used it both externally in the form of a liniment, and internally. He employed it with success, also, in a case of dropsy of the knee-joint. M. Zink has given an account of two cases of white-swelling, both of which were cured with the iodine. (Magendie's Formulary.) We may also cite the testimony of M. Lugal and of M. Bayle in favor of the excellent effects of this remedy in articular affections of this kind. It has been found equally beneficial in *hip-joint disease*. Dr. Manson used it in four cases, two of which were entirely cured, and the others greatly relieved. There are a great many diseases, besides those already mentioned, in which iodine has been found useful. Dr. Manson prescribed it in *deafness*, depending on chronic in-

* See Amer. Med. Recorder, No. xlvi. 1829.

† Boston Med. and Surg. Jour., No. 33.

flammation and thickening of the lining membrane of the Eustachian tube, with great success. He cured, also, several cases of *dysphagia* with this remedy, and for the cure of *fistula lachrymalis* he considers it superior to any other remedy we possess. In *spinal distortions* he says it manifests excellent remedial powers. By keeping his patients at rest in a recumbent posture, and employing the iodine both internally and externally, by frictions over the affected part, and keeping the bowels constantly open by gentle laxatives, the cure was generally effected in the course of two or three months. This remedy has, likewise, been successfully used in *circocele*. Dr. Cartwright mentions four cases of this affection which yielded to the influence of iodine. Magendie states that he has known an inveterate case of ulceration of the tongue and pharynx cured by the use of this remedy. Dr. Oliver, of Salem, employed it with success in several cases of *angina pectoris*. In polysarchia, or excessive corpulency, great benefit was obtained from the use of iodine, by Dr. Græfe, of Berlin. Iodine has been recommended in *enlargement of the prostate gland*, and it is highly probable that much benefit might be derived from it in this distressing affection. I have, in two instances, used it with almost complete success, in chronic enlargement of the tonsils. Advantage might, perhaps, be derived from the use of iodine in ozæna, fungus hematodes, indolent piles, cataract, fungus of the testicle, elephantiasis, osteo-sarcoma, &c.*

PHARMACEUTICAL PREPARATIONS.

Tincture.

℞.—Iodine ℥ss;
Spirit. vini rectificat. ℥i.

Solution of Hydriodate of Potass.

℞.—Potass. hydriod. ℈ii;
Aq. fontanæ ℥i.—M. ft. solut. To form the *Iodureted solution*, ten grains of iodine must be added to the solution of hydriod. of potass.

Ointment of Hydriodate of Potass.

℞.—Potass. hydriod. ℥ss;
Adeps suillæ ℥i.—M. ft. ungt.

Iodic Ointment.

℞.—Iodine ℥ss;
Adeps suillæ ℥i.—M. ft. ungt.

* An Essay on the History, Preparation, and Therapeutic Uses of Iodine. By Samuel J. Hobson, M. D. I have resorted freely to this excellent essay, in drawing up the present chapter.

Iodic Liniment.

℞.—Liniment sapon. comp. ℥i;
Tinct. iodin. ʒi.—M. ft. liniment.

Iodic Pills.

℞.—Iodine gr. x;
Micæ panis gr. v.—M. Divide into twenty pills, one to be taken twice or thrice daily.

The dose of the *tincture* of iodine and of the solution of *hydriodate of potass* is from six to ten drops, three times daily, and gradually increased until it amounts to twenty-five or thirty drops. In some instances, indeed, it may be carried to a much greater extent, without producing any unpleasant effects on the stomach or general system. It may generally be safely increased by one drop per diem. Its effects should, however, always be carefully watched; for in some habits, even moderate doses soon give rise to very violent symptoms. The *solut. potass. hydriod.* is usually much less apt to disagree with the stomach than the tincture of iodine.

The *iodides of mercury* have recently been strongly recommended, and they are doubtless very excellent iodic preparations. They may be administered according to the following formulæ:

Tincture of Deuto-Iodide of Mercury.

℞.—Deuto-iodide of mercury gr. xvi;
Spirit. vini rectificat. ʒxiiiss.—M. Dose, from ten to twenty drops, in a glassful of distilled water, as common water readily decomposes it.

Ointment of Deuto-Iodide of Mercury.

℞.—Deuto-iodide merc. gr. xvi;
Adeps suillæ ʒxiiiss.—M. Highly recommended in the treatment of old and obstinate venereal ulcers. The proto-iodide may be used instead of the deuto-iodide of mercury.

Pills of Deuto-Iodide of Mercury.

℞.—Deuto-iodide merc. gr. i;
Extract of juniper gr. x;
Liquorice powder q. s.—M. Divide into eight pills. Two to be taken at first, morning and evening; increasing the dose subsequently to four.

The *ioduret of sulphur*, made into an ointment with lard, forms an excellent remedy for chronic cutaneous affections.

CHAPTER XVI.

III. *Medicines that alter the State of the Urinary Secretion.*

LITHONTRIPTICS, OR ANTILITHICS.

These are medicines capable of correcting the lithic diathesis, or of dissolving urinary calculi. The urine, even in a state of health, is by no means a simple homogeneous fluid. It contains various substances, in such proportion as to be held in permanent solution. Some of these are liable, from particular causes, to be augmented beyond the proportion which the urine is capable of holding in solution, and they are therefore deposited, creating urinary sediments, gravel, and by further accretion, calculi. A disposition in the system to form such an access of urinary sediments is denominated the lithic diathesis, and constitutes a very important object of medical attention. It appears from the researches of chemists, that these urinary depositions are of very various, and even opposite characters, as they occur in different individuals, or in the same individual, at different times and under different circumstances of health, diet, exercise, drinks, &c. All the varieties of urinary deposits described by authors, may, however, be regarded as composed of the four following elementary substances: 1. The lithic acid and its compounds. 2. The oxalate of lime. 3. The cystic oxide. 4. The earthy phosphates.* Almost all the pulverulent and amorphous sediments consist either of the lithic acid and its compounds, or of the earthy phosphates. The yellowish, or nut brown, reddish-brown or lateritious, or pink sediments are of the former kind. The white precipitate consists of the latter substance. The particular state of the system which favors the formation of the lithic acid or lithates is called the lithic acid diathesis, and that which gives rise to the phosphates, the phosphatic diathesis. What the essential characters of these diatheses are, it would be in vain to inquire. Observation and experience, however, have given us some information with regard to the causes which favor their rise. Thus, it appears, that an excess of lithic acid is especially favored by whatever tends to weaken

* Prout on Calculous Affections, p. 110.

the digestive organs; and especially by those causes, either dietetic or otherwise, which produce acidity in the primæ viæ. It is on this account that persons who live chiefly on vegetable food, are most subject to lithic acid sediment in the urine. The circumstances which appear to favor the formation of phosphatic diathesis, are injuries done to the back, and whatever produces a nervous state of the system, as fear and mental anxiety, and also, the long use of alkaline remedies.* With regard to the influence of the ingesta on urinary deposits, Dr. Wilson Philip draws the following conclusions from an interesting and long series of experiments which he performed on this subject.† "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 by insensible as well as sensible perspiration." Dr. Prout observes that "an unusually heavy meal, especially of animal food or of bread, is invariably followed by a deposition of the lithate of ammonia from the urine."

From these observations it is evident that our most efficacious antilithic means consist of such remedies as are calculated to invigorate the digestive organs, and to correct the morbid contents of

* "A deposition of the earthy phosphates from the urine has been long observed to be attended by very distressing symptoms, though no one seems hitherto to have generalized them. They consist in great irritability of the system, and derangement of the chylopoietic viscera, in general; such as flatulence, and nausea, obstinate costiveness, or peculiarly debilitating diarrhœa, or both frequently alternating; and 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 countenance; and as the disease proceeds, symptoms somewhat analogous to those of diabetes begin to appear."—*Prout's Inquiry into the Nature and Treatment of Calculous Affections*, p. 152.

† Medical Transactions of the College of Physicians in London, vol. vi. 1820.

the primæ viæ; and especially a proper attention to the nature and quantity of the food.

With regard to lithontriptics, or those articles which are supposed to have the power of dissolving urinary calculi, it is obvious that they can produce no solvent effect until they are brought into immediate contact with the calculi. Their modus operandi must, therefore, be very different from that of the antilithic remedies. These appear to produce their remedial effects chiefly by favoring healthy digestion and chylification, and by thus preventing the formation, in the digestive and chylopoietic organs, of an undue proportion of those materials from which the urinary deposits are formed by the kidneys.

The former remedies, on the other hand, pass through the circulation, and being thrown into the urinary organs, exert a solvent power upon the lithic concretes, existing in the kidneys and bladder.

When we reflect how great an influence diet and the state of the digestive organs have upon the nature and quantity of urinary deposits, it would appear highly probable that the ingredients out of which these deposits are formed by the kidneys, are prepared for them in the digestive and assimilative organs, and that they are not formed by the renal emunctories "from whatever may be presented to them indiscriminately."* If this be the fact, it is clear that the remedies which check the formation of urinary sediments act before they reach the kidneys; and that in proportion as they are adapted to restore the healthy condition of the digestive and chylopoietic organs, so they are calculated to act beneficially in the lithic acid diathesis.

It is very questionable whether we possess any remedies capable of dissolving calculi existing in the urinary organs. The attempts at removing calculous concretions by remedies of this kind having hitherto, with very few exceptions, proved abortive, is a fact which sufficiently warrants the skepticism which prevails on this subject. Still, as it is ascertained that some substances exert an evident solvent power upon calculi out of the bladder, and as it is, moreover, equally well established, that these very substances, when taken internally, are absorbed and carried to the bladder, there would appear some reason to expect advantages from the employment of remedies of this kind in calculous cases. Mascagni states that, after using the carbonate of potash, he found his urine so impregnated with it as to convert the yellow color of turmeric to a brown, and to evince no slight solvent power upon a calculus put into it. It must, however, be observed, that the alkalescence of the urine produced by the inter-

* Prout.

nal use of an alkali, is very transient. Mr. Brande states that, in the experiments he made on this subject, he found "that the effect of the alkali, in becoming prominent in the urine, was at its maximum probably in less than a quarter of an hour after it had been taken into the stomach; and in less than two hours the whole of the alkali had passed off.

In speculating upon the lithontriptic power of certain substances, it must not be forgotten that well-attested cases are on record, in which the internal employment of such remedies was followed by a complete cessation of all the symptoms indicating the presence of urinary calculus, and where, notwithstanding, the calculus still remained in the bladder, as was ascertained by the introduction of a catheter. Early in the last century, a Mrs. Stephens received a large pecuniary reward from the British Parliament for discovering a remedy which she used with signal success in calculous affections. It was found, however, that although her patients got rid of all their painful symptoms, the calculi were not dissolved.

De Haen relates a remarkable case of this kind, in which he gave, from November 1756, to June 1757, seventeen pounds of Venetian soap, fifteen hundred pounds of lime-water, and the same quantity of milk. Under this treatment the patient gradually got better until all his calculous symptoms entirely vanished. Notwithstanding this apparent cure, the presence of a calculus was still demonstrable by the sound.* Sir E. Home mentions two cases where the symptoms had subsided under the employment of alkaline medicines, but on dissection the calculi were found of great size, imbedded in cysts. He, moreover, states that, in some instances, the calculous concretions increased rapidly while the patients were taking these remedies regularly. One patient took alkaline medicines four or five years, and, "at his death, the bladder was found nearly filled with light spongy calculi of different sizes, not less than three hundred and fifty in number. Another who had taken soda, both mild and caustic, for some months, and then submitted to the operation on the symptoms increasing, was found to have a calculus, which was surrounded with a coat of triple phosphate one-tenth of an inch thick, the rest being a mixture of uric acid and phosphates. Whytt supposes that, in cases where the symptoms disappear under the use of lithontriptics, the calculi, though not dissolved, have their asperities removed, and that they are coated by a mu-

* Calculi verus martyr sumptis libris 17 saponis Veneti, 1500 libris lactis, et 1500 libris aquæ calcis, liberatus sic fuit ab ejus symptomatibus, ac si ultra ne adesset calculus; qui tamen et post curam, et el apso post eandem anno, præsens demonstratus cathetere fuit.—*Ratio Medendi*, vol. i. p. 138.

cilaginous crust, by which they are prevented from doing injury to the tender parts with which they are in contact. "Exemplo nobilissimi equitis H. Walpole aliorumque, debuit concludere si calculi non solverentur, eis tamen asperitates demi, circumvolvique crustam mucilaginosam, quæ ne noceat calculus, efficiat."* Dr. Marcet† also contends that, although little or nothing can be expected from this class of remedies, in destroying calculi already formed, "yet, in some instances, the sharp edges of small calculi may be so blunted by the internal use of chemical solvents, as to allow them to be passed with less difficulty and inconvenience." Where, therefore, the symptoms of calculus disappear under the internal use of solvent remedies, we cannot conclude positively that the calculi have been dissolved and removed out of the system, especially if they be located in the kidneys, in which case we can derive no information from examinations with the sound.

Therefore, experience is decidedly opposed to the opinion which ascribes any very particular solvent power to this class of remedies. From the same source, however, we learn, with equal assurance, that these remedies are often of unequivocal advantage in certain gravelly affections, and especially in counteracting the tendency which often prevails in the system to form an excess of lithic matter with urine. I would, however, ascribe very little to the solvent power of these remedies; nor can I believe that they produce any very considerable effect by the power they may have of neutralizing the uric acid before it has time to form concretions, and thus prevent, as Mr. Brande supposes, the further increase of calculi.‡ The medicines which are most useful in this respect, tend to correct acidity in the primæ viæ, and to favor the digestive process; circumstances which, I have already said, have a very intimate relation with the generation of lithic matter by the renal emunctories.

In treating of the particular articles of this class of remedies, I shall have occasion to speak more especially on this point; to which, therefore, I now proceed.

CARBONAS SODÆ ET POTASSÆ.

When we advert to what has already been stated concerning the tendency of acid and acescent ingesta to increase the secretion of lithic acid and its compounds, by the kidneys, and of the influ-

* I have not access to the works of Dr. Whytt, and therefore quote from De Haen's Ratio Medendi, vol. i. p. 136.

† Marcet on Calculous Disorders. London, 1817.

‡ Philosophical Transactions, for 1810, Part I.

ence of an acid condition of the contents of the primæ viæ, from indigestion, there can be no difficulty in perceiving that the fixed alkalies may operate beneficially in urinary depositions composed of lithates or lithic acid. For, whether we admit their solvent power or not, it would appear quite reasonable to suppose that, as these urinary sediments are more copiously secreted by the kidneys when morbid accumulations of acid exist in the stomach and bowels, the remedies in question would, by removing this exciting cause, tend to correct the renal secretions. I would not, however, ascribe everything, in this respect, to the mere antacid properties of the alkalies. They are, undoubtedly, absorbed to a degree into the circulation, and again thrown into the urinary secretion, and may thus exert some remedial effect, not only by their immediate action upon the secretory vessels of the kidneys, but also, in a small degree, perhaps, by their solvent properties. Be this as it may, there can at present be but little doubt of the utility of alkaline remedies in correcting the lithic acid diathesis, or of occasionally affording relief in nephritic and calculous affections.

It is thought by some late writers* that the alkalies are inferior to magnesia, as antilithics; and Sir E. Home accounts for their inferiority, by supposing it to depend on the greater insolubility of the magnesia and in consequent longer retention in the stomach, affording it thereby a greater opportunity of counteracting "the formation of uric acid." I am much more inclined, however, to adopt the opinion of Scudamore on this subject. He contends "that, although some advantage is afforded to the alimentary canal by its power of neutralizing acid matter, yet that its (magnesia) chief superiority over the alkalies depends on its purgative qualities; so much more easy is it to arrest the morbid process of digestion by a medicine which removes the cause, than by one which merely has the effect of temporary correction."

When the lithic acid sediments prevail, we almost invariably find the digestive process out of order, and much acidity in the alimentary canal; and from what I have already said concerning the connection between such a state of the digestive organs, and the secretion of uric acid by the kidneys, it is quite plain that the alkalies are the proper remedies. For, although it does not appear that they reach the urinary passages in sufficient quantity to exert any particular solvent power upon the pre-existing calculous matters in these organs, still, however, the prevailing tendency of the system to form lithic matter may be checked, "by the beneficial changes which they produce during the first stages of assimilation, by neutralizing excess of acid, or otherwise disturbing those affinities, which in the subsequent process of assimi-

* Sir E. Home, Brande, Scudamore, Prout, &c.

lation and secretion, give rise to calculous affections."* Independent of the effects which are here ascribed to the action of the alkalies, they appear to possess very considerable power in allaying the morbid irritability of the urinary passages. It is very different, however, with the white urinary sediments. These, as has been observed above, consist of earthy phosphates, forming a triple compound with ammonia, and are, in general, unconnected with indigestion and acidity in the primæ viæ. In urinary sediments of this description, the alkalies are not only useless, but absolutely pernicious. "The white sediments," says Mr. Brande, "may always be abundantly formed by alkaline medicines, and persons who habitually drink soda water, or take magnesia, are frequently voiding it. Its appearance, in the latter cases, has often led to serious errors. I have known soda water, exhibited in a case of a stone in the bladder, produce abundance of white sand, which the ignorance of the patient and his medical attendant led them to refer to the solvent power of the medicine upon the stone, which they thought was giving way and being voided; whereas, great mischief was doing by giving the urine more than its usual tendency to deposit the phosphates, and consequently to augment the size of the calculus."†

The alkaline carbonates are generally given in preference to the pure alkalies. They appear to answer equally well, and are much less offensive to the stomach. "The stomach," says Dr. Paris, "appears to bear the protracted exhibition of the carbonate of potass and soda, with more temper than it does any other alkaline combination. From twenty to fifty grains of carb. of soda or potass may be taken two or three times a day. The liquor potassæ, or sodæ, may be taken in solution, in doses of from gtt. xv to gtt. l, two or three times a day, in veal broth or table beer," which latter is said to disguise its nauseous flavor completely. Whilst pursuing a course of alkaline remedies, it will be useful, occasionally, to interpose a purgative medicine. Upon this point, Dr. Paris observes, "we must not combine it (the purgative) with the lithontriptic, for it is a law, that catharsis suspends the process of absorption." If it were true that the antilithic power of the alkalies depended on their being absorbed and conveyed to the urinary organs, this caution would no doubt be very proper. But this is extremely doubtful; and it appears, moreover, that magnesia, whose powers in this way are superior to those of the alkalies, operates most beneficially when it produces a purgative operation.

Besides, the existence of such a law is by no means established.

* Marcet.

† Brande's Observations on the Medico-Chemical Treatment of Calculous Disorders. Quarterly Journal of Science and the Arts, No. 12.

Every one must, indeed, admit that, while purging is going on, absorption must be diminished; but it is much to be doubted whether it is suspended. Rhubarb impregnates the urine with its color, notwithstanding its purgative operation;—here absorption is not suspended. From Mr. Brande's experiments, it appears very clearly, that neither the carbonates nor subcarbonates of the fixed alkalies, exert any sensible action on uric acid; and it seems equally clear, from what this able writer says, "that an alkali administered to a calculous patient, stands no chance of reaching the uric concretion in a caustic state." If these facts be correct, and there can scarcely be a doubt on this point, we have a very plausible explanation of the inefficacy of the alkaline carbonates as solvents of urinary calculi. Alkaline solutions have been injected into the bladder through the urethra; I have not, however, learned that any decided advantage has been gained from such a practice. Fourcroy and Vauquelin paid particular attention to this mode of dissolving urinary calculus.

Incompatible substances: "acids and acidulous salts, borax, muriate of ammonia, acetate of ammonia, alum, sulphate of magnesia, lime-water, nitrate of silver, ammoniated copper, muriate of iron, submuriate and oxymuriate of mercury, acetate of lead, tartarized antimony, tartarized iron, the sulphates of zinc, copper, iron," &c.

MAGNESIA.

The antilithic powers of magnesia are very considerable, and appear to be pretty generally acknowledged by the practitioners of the present day. Mr. Brande, in an interesting paper published in the Philosophical Transactions, first directed the attention of physicians to the efficacy of this remedy, in preventing the formation of certain varieties of urinary depositions. Instead of pursuing the hopeless inquiry after an efficient solvent for urinary calculi, physicians and chemists have of late endeavored to ascertain the nature of urinary sediments, and the causes which influence their increase and decrease, "with the view of administering such preventive medicines as may indispose the system to produce those concretions, or check their growth, without altering the tone of the constitution." From some trials made by Mr. Brande, he found that magnesia diminished the quantity of uric acid in the urine, more promptly and conspicuously than any of the alkalies, however largely administered. He relates four cases in which the antilithic powers of this remedy were unequivocally displayed.* The first was a gentleman whose urine was

* On the Efficacy of Magnesia in preventing an Increased Formation of

constantly highly charged with uric acid, which was deposited in the form of red sand or crystals. He successively took the subcarbonates of soda and potass without any benefit from the former, and but little from the latter. He was finally directed to take fifteen grains of magnesia three times a day; in a week after commencing with this remedy the uric deposits were sensibly diminished. The medicine was continued for eight months, and the urinary deposit disappeared entirely. Another patient, suffering from a similar complaint, after having tried the alkalies ineffectually, was wholly cured by taking twenty grains of magnesia, night and morning, for six weeks only. The third case is that of a person who succeeded in removing repeated attacks of uric acid, by the use of magnesia. The fourth case was a confirmed calculous tendency, which yielded almost completely to the free use of magnesia. Dr. Scudamore, whose opinion deserves great weight, does not admit the claims which are allowed to magnesia, as a remedy in gravelly affections. "I condemn," says he, "any unlimited confidence in this medicine, as being, in most cases of complaint, a very inadequate remedy for the disease which is existing. The gravel and the gout are, as it were, but symptoms of the morbid action of other parts; and the primary disease and its true cause are to be found in the digestive organs. But the gravel has a deeper foundation than the mere production of acid matter in the alimentary canal. In these cases we must look with vigilance to the state of the stomach, of the liver, and of the bowels, and to all the digestive assimilation, in connection with the wrong functions of the kidneys, in a manner less superficial than the rule of placing all our dependence on magnesia, or upon any alkaline medicine whatever, seems to imply. We shall learn that these remedies are useful, and even important, as auxiliary parts of treatment, but they do not deserve any higher character, or stronger dependence."*

It is scarcely necessary to observe, from what has already been said, that magnesia, like the alkalies, can only be properly administered in gravelly affections when the urinous precipitate is of the uric acid description; without an attention to this circumstance, the use of magnesia may become very pernicious in calculous complaints. I have lately employed this remedy in the case of a person much harassed by indigestion, and whose urine was loaded with an uncommon quantity of uric acid. The vessel into which he discharged his urine was coated with a crust of this substance. I ordered him twenty-five grains of magnesia three

Uric Acid, &c., by W. T. Brande, M. D., in the Philosophical Transactions, 1810, Part I.

* Scudamore on Gout, p. 256.

times a day, with infusion of gentian and orange peel. In less than three weeks the uric deposit had nearly disappeared; but I could not succeed in removing it wholly, although he took it for upwards of four months. Magnesia has lately been strongly recommended as a remedy for diabetes. Dr. Trotter has published an account of five cases which were effectually cured by this remedy. 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 from it was generally very prompt, and the cure, in the course of a few weeks, perfect.*

Since publishing the first edition of this work, I have had occasion to prescribe in two cases of diabetes. In one case, which was of long standing, but not very violent, the magnesia proved effectual. In the other case, however, which was violent and rapid in its progress, this remedy did not produce the slightest beneficial effect.

AQUA CALCIS.

Lime-water† was formerly much employed in calculous affections; and there can be no doubt of its having sometimes manifested very useful powers in these complaints.

Like the two former articles, it exerts but little or no solvent power upon urinary concretions, when taken internally. It appears to act chiefly by correcting that state of the digestive organs upon which the lithic acid diathesis would seem to depend. Whytt, De Haen, Alston and others mention cases of its successful employment for the removal of the symptoms of calculous complaints. It appears that, like the alkalies, it has been known to give effectual relief in calculous complaints, without, however, dissolving or removing the calculus. I have already quoted a case of this kind from De Haen, and similar ones are related by Whytt, Alston and others. In nephritic affections, depending on calculous concretions, or on too abundant a secretion of uric acid, the free use of lime water will often afford great relief.

Lime-water is generally directed to be given in milk to the extent of from a pint to a quart daily. Whytt gave it in combination with soap; but it does not appear to be more powerful in this way, and is much more unpleasant to take, than when mixed with milk. Attention must be paid to the nature of the urinary deposit: its exhibition, where the phosphates predominate, would prove not only of no avail, but very pernicious.

* Lond. Med. and Phys. Journal, vol. xxxix. p. 366, and vol. xlvii. p. 460.

† Contains about 1.680 of lime.

Lime-water has been employed for various other remedial purposes. It has been much recommended for its good effects in diabetes. Dr. Ferriar constantly gave it as an auxiliary remedy in cinchona, opium and uva ursi. Shutz and Welheim, two German writers, detail cases of diabetes mellitus and insipidus, in which the use of lime-water alone proved successful.* It has also been employed with advantage in dysury depending on excess of lithic acid in the urine. In a case of this kind I prescribed it with the happiest effect. Pringle, Mar and others recommended lime-water with milk in phthisis, and not a few cases have been reported in testimony of its efficacy.

As gout is always connected with lithic acid diathesis, lime-water, having a tendency to counteract such a disposition, may often be usefully employed in the chronic form of the complaint. It is very advantageously united with bitters in gouty complaints. In the cure of obstinate scorbutic ulcers, lime-water has been known to produce very excellent effects. There is a case of this kind, related in the first volume of the London Medical Observations and Inquiries, which was effectually relieved by taking three pints of lime-water every day for five months, after a multiplicity of other means had been tried without any benefit. The ulcer was of several years' standing, and situated on the left leg. Hoffman asserts that there is no remedy equal to lime-water in that variety of scurvy which proceeds from the continued use of salted diet. Baumbeck speaks well of lime-water as a remedy in cancer; but it is scarcely necessary to observe, that, in this respect, it is not entitled to the least attention.† It has also been found useful in chronic dysentery, leucorrhœa, and chlorosis. It may in general be usefully given in all cases attended with a sluggish, phlegmatic habit of body, and an acid state of the contents of the alimentary canal.

As an external remedy, lime-water may be applied to very useful purposes. With olive oil it forms a most excellent liniment for burns and scalds; and with corrosive sublimate, it constitutes the aqua phagedenica, a highly useful wash for foul and sluggish ulcers, particularly of the syphilitic kind.

According to Hufeland and others, lime-water, mixed with some mucilaginous decoction, forms an exceedingly useful injection for the removal of ascarides.

If the internal use of lime-water occasions heat and thirst, the sweet spirits of nitre ought to be given two or three times a day, according to the advice of Whytt. It is, in general, useful to

* Hufeland's Journal of Practical Medicine, vol. ii. p. 128.

† Vogel, Repos. Dissertatio de curatione cancri occulti et aperti per aquam calcis vivæ potam præstita. Gotting. 1769.

employ some bitter tonic infusion whilst taking the lime-water. Acid drinks must be avoided during a course of lime-water.

MINERAL ACIDS.

The alkalies and alkaline earths, as is stated above, are the appropriate remedies in the lithic acid diathesis. They can only be employed with propriety as antilithics, when the urinary deposits are of the red or lateritious kind, or, in other words, consist of calculous matter, in which the uric acid predominates. As might be supposed, quite the reverse obtains in relation to the employment of the mineral acids in calculous affections. These are by no means fit remedies when the sediments are of the uric acid kind; but their antilithic power is generaly unequivocally evinced in complaints in which the phosphatic diathesis prevails, and where the calculous sediments are white, or of that species in which the earthy phosphates predominate. "When from any cause," says Mr. Brande, "this white sediment appears, the internal use of acids will, in most cases, diminish or remove it." It is asserted by those who employ the alkalies and acids in calculous complaints, on chemical principles, that the urine "has a tendency to deposit white sand whenever its natural acidity is diminished, as is shown by the addition of a little alkali to recently voided urine, which immediately throws down a white powder." The modus operandi of acids in preventing such deposits would therefore appear to be easily explained; for as it is demonstrable that acids taken into the alimentary canal show themselves again in the urine, it is evident that, to obviate the depositions of this white sediment, we need only to exhibit an acid internally, with a view of augmenting the acidity of the urine, and thereby enabling it better to hold its earthy phosphates in solution. Dr. Scudamore opposes the chemical theory on this subject, and maintains that the phosphates are deposited, notwithstanding the existence of a free acid in the urine. "I have now arrived at the end of an extensive examination of specimens of urine depositing the phosphates, and also holding them in solution, yet still having the power of reddening litmus in the usual manner."* He thinks that the mineral acids are useful in cases where the gravelly deposit consists of the earthy phosphates, simply by their tonic action on the stomach. That acids may prove advantageous in such complaints, by their tonic operation, can hardly be doubted. But if any considerable share of their good effects depended on a tonic influence, we ought, I think, to see them as efficacious in

* Scudamore on the Gout, p. 256. American edit.

the lithic acid depositions as in those consisting of the earthy phosphates, since the former are generally even more conspicuously connected with a weakened state of the digestive organs than the latter. Still, however, it is undeniable, that bark, exercise, bitters, and mineral tonics, are often successfully employed in complaints attended with urinary deposits of this kind. "The febrile affections of children are very frequently attended by an apparently alarming deposit of white sand in the urine, and a dose of calomel will often carry off both the fever and sand."

Whatever may be the modus operandi of mineral acids in diminishing the earthy phosphates of the urine, their utility in this way seems to be fully established.

The nitric, the muriatic, and the sulphuric acids, have each been employed to check the formation of white urinary sediment. The nitric acid is thought by Mr. Brande to be more liable to occasion those symptoms of indigestion which are attended by flatulency and eructations, than the other two acids, "and in a few particular cases, its long-continued use has rendered the patient reluctant to take food; though many instances might be cited of its tonic effects, as a promoter of digestion and increaser of appetite."

The sulphuric acid has a much more uniformly tonic effect, and may usually be persevered in much longer than the nitric and muriatic acids, without producing griping and other disagreeable gastric affections. The muriatic acid, though mostly agreeing very well with the stomach, is apt, by long use, to act upon the bowels, and to bring on a troublesome diarrhœa. "This circumstance," observes Mr. Brande, "however, often recommends it; for constipation very frequently attends the state of the body which favors the formation of white sand." "When the mineral acids agree," says this writer, "they are usually very effective, and in a few days they diminish or entirely prevent the formation of the sabulous deposit; but where they disagree they rather increase the quantity, or they tend to the production of a mucous secretion, probably from the coats of the bladder, which envelops and is voided with the sand, and which, in particular cases, may certainly tend to increase the risk of its agglutinations, and of the formation of a concretion in the bladder. The mineral acids, too, almost always disagree with children, who are equally liable with adults to an increased secretion of the phosphates, and in whom prompt and effectual treatment is equally requisite to prevent the formation of a stone in the bladder."* In cases of this kind recourse must be had to the vegetable acids. The

* Brande on the Medico-Chemical Treatment of Calculous Disorders. Quarterly Journal of Science and the Arts, No. 12.

tartaric acid may be given freely, either in a pure state or in combination, as in cream of tartar. From five to twenty grains of the former, and from twenty to sixty of the latter, may be administered two or three times a day. The citric acid is, however, preferable to the tartaric, and may be administered in doses of from five to sixty grains; it rarely proves inconveniently purgative, and is very effectual in modifying the secretion of urine.

Although the vegetable acids, when properly administered, will seldom increase the phosphatic diathesis, yet it appears from the observations of the writer I have just quoted, that cases do occur where a copious white deposit is attended with a peculiar irritability of the bladder, and which are aggravated by any of the acids just mentioned.

When a copious white sabulous deposit in the urine is connected with a biliary derangement, as is sometimes the case, it will be best to depend rather on an acescent regimen than on medicine; "and to obviate costiveness, if necessary, by an occasional dose of magnesia in a glass of sour lemonade."*

CARBONIC ACID.

This gaseous acid was at one time much in vogue as a solvent for urinary calculi. It appeared from the experiments of Hales, that water, impregnated with carbonic acid, has the power of gradually dissolving urinary calculi; and it was demonstrated, also, that, when taken into the stomach, it soon makes its appearance in the urine. Hence it was concluded that, by means of this aërial fluid, we might readily dissolve "human calculi while yet in the bladder;" an opinion which was zealously advocated by Percival, Saunders and others. Whether the opinion of these men be correct or not, with regard to the modus operandi of carbonic acid, in gravelly disorders, there appears to be no reason to doubt its occasional utility in preventing the white urinary deposit. Where, from peculiar circumstances, in cases of this kind, the other acids disagree with the patient, the carbonic acid, Mr. Brande observes, will often afford very decided advantages. This acid may be very conveniently taken, as it is dissolved in the artificial mineral waters, "or it may be administered in the form of a saline draught, in the state of effervescence; which is best done by dissolving thirty grains of carbonate of potash, and twenty grains of citric acid, in separate tea-cups of water, and then mixing the solutions in a large tumbler, and drinking the

* Brande.

whole during effervescence. This dose may be repeated two or three times a day, or oftener if expedient."*

UVÆ URSI FOLIA.—BEAR BERRY.

The uva ursi is an evergreen, creeping plant; with small, oblong, oval leaves, resembling very closely those of the common garden box. It is indigenous both to Europe and the United States. The leaves have an odor bearing some resemblance to that of hyson tea, and are of a bitterish and sub-astringent taste. They contain "tannin, mucilage, gallic acid, extractive resin, and traces of lime;" and yield their active principles both to alcohol and water.

The virtues of this plant are variously represented by writers on the materia medica. Alibert says, "all that can be said of this remedy is, that its action is, under certain circumstances, manifestly diuretic;" and he declares that its supposed specific power in nephritic and other diseases of the urinary passages has not the least foundation.

The weight of testimony is, however, greatly in favor of its remedial powers in disorders of this kind. The account given by De Haen of its efficacy in diseases of the urinary organs, is indeed exceedingly flattering, and although few other practitioners may have been equally successful with it, there is, notwithstanding, sufficient evidence extant to warrant us in regarding it as a useful remedy in such diseases. De Haen relates some very remarkable instances of the successful use of uva ursi in calculous and nephritic affections. He employed it with much success, also, in a case of ulceration of the penis and perineum from calculus in the bladder, and in purulent discharges from the urinary passages. He insists, however, that this remedy is wholly ineffectual in cases where there is much derangement of the internal urinary organs, whether from calculi, pus, or too frequent and long retention of urine. "Magis confirmor," he says, "magisque in eo quod in hoc opere toties monui, nullarum eam virium esse, ubi in systemata urinoso interno multa facta fuerit, sive a calculo, sive a pure, sive ab urina, sæpius diutiusque retenta, degeneratio."†

He states that, in several instances of urinary calculus, this remedy afforded complete relief, "although the catheter showed that the calculus still remained." It does not appear, from late experience, however, that any dependence is to be placed on this remedy in calculi of the bladder. In nephritic affections from

* Brande, Philosoph. Trans., 1813, p. 213.

† Ratio Medendi, vol. iii. p. 117.

gravel and other cases, we have abundant proof of its utility. Dr. Ferriar, whose testimony deserves the highest respect, says, "I have given this remedy (uva ursi) in a considerable number of nephritic cases, in very moderate doses, and always with manifest advantage." It must be confessed, however, that we are by no means warranted in ascribing all the good effects of the practice detailed by Dr. Ferriar to the uva ursi. He states that, "when the pain was very acute and the pulse quick, he began the cure with bleeding and a gentle purgative, composed of manna and a neutral salt. This purgative he repeated twice a week, and on the intermediate days directed the patient to take five grains of uva ursi, and half a grain of opium, three or four times a day.* Out of sixteen patients treated in this way he cured twelve. It is impossible to say how much of the good effects of this treatment is to be attributed to the uva ursi. That some, however, perhaps a considerable share of the success, is to be ascribed to this remedy, may be inferred from its beneficial operation in diseases of this kind, when administered by itself, as I have myself witnessed in a few instances. Dr. Ferriar observes, that he never found it necessary to give it in larger doses than five grains, and that in doses of a scruple or half a drachm he found it to produce nausea, even when given with opium. The same circumstance is mentioned by Lewis. "In all the cases," says he, "that have come to my knowledge, it produced great sickness and uneasiness."†

In that variety of urinary disease which is attended with copious white sediment in the urine, especially in the last portions discharged, occasioning pain and irritation in the urethra, Dr. Prout states that "he has often seen the greatest advantage from the combined use of muriatic acid, hyoscyamus and uva ursi, together with the use of alterative purgatives." I have a patient under my care now, who has been for upwards of two years exceedingly afflicted with a pain in the region of the right kidney, attended with all the usual symptoms of renal calculus. He has been gradually getting better under the use of uva ursi and opium, in doses of twelve grains of the former with half of the latter, three times a day; and is at present almost entirely free from any symptoms of his disease. The late professor Barton thought it particularly serviceable in nephritis depending on gout. "In my own nephritic paroxysm," he observes, "alternating with attacks of gout in the feet, I have certainly found the medicine of much service; and I confidently and with much pleasure re-

* Medical Histories, vol. i. p. 56.

† Materia Medica.

commend it to the notice and trial of other sufferers from the same affection."*

Of the modus operandi of uva ursi in nephritic and calculous disorders, we are entirely uninformed; nor will I consume the reader's time by speculations upon a topic which has been so fruitlessly attempted by many of the ablest physicians.

The remedial employment of uva ursi has, however, not been confined to affections of the urinary organs; it has been equally extolled in the cure of other maladies, particularly in diabetes, consumption, leucorrhœa, hæmaturia and gonorrhœa.

In the treatment of diabetes, Dr. Ferriar was in the habit of giving it in conjunction with cinchona, opium and lime-water.† Dr. Bourne, professor of the practice of physic in the University of Oxford, speaks very highly of the efficacy of uva ursi in the cure of pulmonary consumption. He states that, out of sixteen cases treated with this remedy, nine were cured, four relieved, and three died. This is certainly very extraordinary success; and is calculated to create the suspicion that some error in *diagnosis* may have occurred. He gave the medicine in ten grain doses, with half a grain of opium, three times a day.‡

It is best administered in the form of powder. The dose is from ten grains to one drachm.

HUMULUS LUPULUS.

The hop was at one time much recommended for its supposed lithontriptic properties. It has also been thought to be favorable to the production of calculous affections. From my own experience I can say nothing in favor of its antilithic powers. Nor do I believe that it is entitled to any attention for its properties in this respect. Several of the bitter astringent vegetable medicines have been commended for their good effects in cases of gravel and calculus. The gentiana lutea and quassia have been particularly mentioned as useful in affections of this kind. From the frequent connection of gravel and disordered function of the digestive organs, and the apparent dependence of the former on the latter, it is not at all unlikely that these articles may often produce beneficial effects in nephritic and gravelly disorders. They may in general be very usefully given conjointly with the alkaline antilithics, as has already been stated when speaking of these remedies.

* Barton's edition of Cullen's Materia Medica, vol. ii. p. 422.

† ℞.—Pulveris uvæ ursi, corticis Peruvian., āā ℈ii; opii gr. ss; quater in die sumend. bibat aquæ calcis ℥ii; post sing. dos. pulveris.

‡ Cases of Pulmonary Consumption, &c., healed by Uva Ursi, to which are added some Practical Observations. London, 1806, p. 393.

CHAPTER XVII.

IV. *Medicines that promote the Secretory Action of the Salivary Glands.*

SIALAGOGUES.

HYDRARGYRUS.

It does not appear that the Greek and Roman physicians had any knowledge of the medicinal properties of mercury. They regarded it as a dangerous poison, and excluded it from the materia medica.* It was first employed by the Arabians, as an external remedy in the itch and other cutaneous eruptions. The corrosive sublimate and red precipitate, two of the most active preparations of this metal, are mentioned by Geber; and both Rhazes and Avicenna speak of the outward employment of mercurial remedies. In Europe mercury was used externally in cutaneous disorders, as early as the twelfth century, by Gilbert, Theodoric, and others; but it was not employed as an internal remedy until early in the sixteenth century, when John de Vigo first gave it in the plague. About the same time Mathiolus used it internally in the cure of lues venerea; and Paracelsus adopted and advocated its employment with his characteristic zeal and enthusiasm. From this period the reputation of this medicine gradually extended itself, though not without great opposition; its powers became more correctly appreciated; and its application to the cure of diseases conducted upon more rational principles.

In its metallic form mercury does not appear to possess any medicinal properties; but in the state of its various preparations, its influence on the animal economy is extensive, powerful, and important. Such, indeed, are the variety and extent of its remedial powers, that it may be most effectively employed in the form of its different preparations, as a sialagogue, an errhine, a cathartic, a diuretic, a sudorific, an emmenagogue, an astringent, a stimulant, an antispasmodic, and an anthelmintic; and hence

* Δύναμιν δὲ ἔχει φθαρτικὴν τοιαύτα τοῦ βάρεος διὰ ἐκβράσματα τὰ εἴδη.—*Dioscorides*, lib. v. cap. cx.

we at once see how exceedingly various and important must be its therapeutic relations. Of all the sensible effects of mercury, salivation is the most remarkable, and viewed as an evidence of its specific or general influence, undoubtedly the most important result of its operation.

Mercury, it is observed by Cullen, "acts as a stimulus to every sensible and moving fibre of the body." What the peculiar character of the excitement which it produces may be, it would be in vain to inquire; but it appears to be more permanent and universal than that of any other medicinal agent with which we are acquainted.

There are three modes in which mercury appears to act, in producing its effects on the animal economy: 1. It is absorbed into the circulation, and acts through the medium of the blood. 2. It produces a primary impression in the part to which it is applied, which impression is propagated to other parts by means of the nerves. 3. It acts locally, by simply exciting an action in the parts to which it is directly applied.*

That mercury is carried into the circulation, and conveyed with the blood throughout every part of the system, is demonstrated by the fact of its presence having been detected in the solids and fluids of the body, and particularly in some of the secretions. Zeller states that he found quicksilver in the bile; and Wepfer,† Laborde,‡ Brodbelt,§ and others mention instances in which this metal was found in the bones of persons who had died after severe and tedious mercurial courses. Dr. Hamilton detected globules of mercury in the milk of women in a state of salivation; and it is a fact well attested, that gold worn near the skin, by persons taking mercury, occasionally becomes covered with a white amalgam—a circumstance which proves the presence of mercury in the cutaneous discharges. The absorption of mercury into the circulation may also be inferred from the peculiar metallic taste of the tongue, and the well-known mercurial odor of the breath and perspiration of those who are under the specific influence of this metal.

Dr. Ives, in the very excellent essay on the modus operandi of mercury to which I have already referred, observes: "Where mercury produces its specific action on the constitution, it appears to be previously absorbed into the blood-vessels. It there becomes a new and peculiar source of irritation to all the organs concerned

* Dr. A. W. Ives, in the Appendix to Hamilton's Observations on the Use and Abuse of Mercurial Medicines.

† Observationes Anatom., p. 303.

‡ Journal de Médecine, tom. l. p. 27.

§ Samlung auserles. Abhandl. f. pr. Artz. B. xix. s. 547.

in the circulation and the various secretions; it extends its influence through the medium of the blood to the nervous system, increasing its irritability, and thereby reacting upon the heart and arteries, and thus perpetuates the train of constitutional morbid associations which constitutes mercurial fever."

With regard to the sympathetic effects of mercury, also, I will quote the observations of Dr. Ives, because they express in clear and concise terms what I would wish to say on this subject. "It has been shown, by the experiments of M. Bichat, and it is confirmed by daily observation, that the secretory action of the glands is increased by stimulating the mouths of their excretory ducts; it is in this way that mercurial preparations usually excite their deobstruent effects; but they appear, also, to have a sympathetic action, which is much more extensive. It is that which Mr. Hunter, in order to illustrate the spread of disease, has denominated continuous sympathy, and which Bichat has pointed out as being maintained with peculiar vigor between membranes of the closest similarity of structure. In this way, it seems that mercurial medicines, when taken into the stomach, extend their operation to other and distant portions of the mucous membrane, producing an increased discharge from the kidneys, lungs, skin, &c. Other medicines frequently exert their influence by this sympathetic action, particularly on the mucous membranes; astringents are often applied to one portion of this membrane, to check a hemorrhage in another portion."

The local operation of mercury is manifested by the purging and vomiting which some of its preparations produce; it is also evinced by the effects which very minute doses of calomel display in allaying morbid irritability, or inordinate peristaltic action of the alimentary canal, in cholera, diarrhœa, &c.

When mercury is introduced into the system so as to excite its specific action, it at first increases the action of the heart and arteries; the pulse becomes quick, tense, and occasionally full, the gums become tender, accompanied with a peculiar metallic taste of the mouth and fetor of the breath. If the mercury be pushed further, the tongue, gums and salivary glands begin to swell; the teeth become painful and loose; the saliva flows in great abundance; small ulcerations make their appearance on the tongue, gums and roof of the mouth; the appetite fails; occasional pains are felt in the stomach and bowels; the countenance acquires a peculiar expression, indicative of a distressful morbid irritability of the system; and much debility and emaciation commonly ensue. These are the ordinary phenomena of a regular mercurial course. Instances, however, occur, in which, owing to peculiar susceptibilities of the system, the action of mercury produces a train of symptoms which, so far from being salutary, are

attended with much distress and danger, and permanent injury to the constitution. Palsy and epilepsy, and even death, have been known to supervene in consequence of the action of mercury. Mr. Pearson has described these unfavorable effects of mercury under the name of *erethismus*. "This state," he says, "is characterized by great depression of strength, a sense of anxiety about the præcordia, irregular action of the heart, frequent sighing, trembling, partial or universal, a small, quick, and sometimes intermitting pulse, occasional vomiting, a pale contracted countenance, a sense of coldness; but the tongue is seldom furred, nor are the vital or natural functions much disordered."

Fortunately, however, these distressing consequences of the action of mercury are but very rarely witnessed, and appear to depend either on idiosyncrasy of constitution, or on improper exposure and management during the mercurial influence. Every powerful article of the materia medica, indeed, may, under circumstances of idiosyncrasy or mismanagement, produce deleterious consequences. It is the abuse of such remedies that renders them dangerous; cautiously employed, they are the means which God has placed in the hands of man, to mitigate and remove pain and disease.

We sometimes meet with persons so unsusceptible to the action of mercury, as to make it extremely difficult, or even impossible to bring them under the specific influence of this remedy, unless measures be resorted to capable of doing away such resistance to its operation. In general, a very feeble, and a very full and phlogistic habit of body, are alike unfavorable to the action of mercury. When the former condition exists, opium, wine and the Peruvian bark are indispensable; in the latter state of the body, bleeding and purging are to be employed. But there are states of the system which are connected neither with plethora nor debility, but in which, notwithstanding, there exists a powerful resistance to the operation of this remedy, and in which neither bleeding nor opium is of the least avail. Under circumstances of this kind, I know of no means more powerful in awakening the susceptibility of the system to the influence of mercury, than nauseating doses of antimony or ipecacuanha. My friend and preceptor, Dr. Joseph Klapp, of this city, from whom I learned the value of this practice, has been much in the habit of exhibiting these remedies in conjunction with mercury, with a view of accelerating its specific influence; and he informs me that he has seldom failed to establish the mercurial action in a short time, by these means, after the system had resisted the unaided operation of this remedy for many weeks and months. Upon this subject Dr. Paris remarks: "Reiterated practice has taught me that the system, in a strong and healthy condition,

frequently offers a resistance to the operation of mercury, which is overcome the moment the stomach becomes deranged, the circulation languid, or the general tone of the system impaired. I have frequently seen this during my hospital practice: if a patient who has been using mercurial friction, or taking the preparations of that metal without effect, be transferred into a close and unhealthy ward, his appetite soon fails, the tongue becomes furred, and the system instantly yields to the influence of the remedy. Nauseating doses of antimony frequently repeated, or the accidental supervention of any disease of debility, will be attended with the same phenomena."* Of the efficacy of nauseating doses of antimony, in overcoming the resistance of the system to the action of mercury, I have lately had a remarkable example. After having tried ineffectually, for nearly two months, to bring a venereal patient under the specific influence of mercury, employed both internally and externally, I at length, by the suggestion of Dr. Klapp, gave him nauseating doses of tartar emetic, and by these means succeeded, in less than three days, in establishing a gentle salivation.

Dr. Paris suggests that nausea, and other causes which derange the digestive organs, favor the salivant influence of mercury, by the power which they may possess of "overcoming the resistance which nature, in a state of health, makes to the admission of poisonous substances into the circulation." This explanation is, however, wholly hypothetical; since it is perfectly ascertained that a state of health is, in general, the most favorable condition of the system for the specific influence of mercury. It is, moreover, predicated upon the supposition that remedial substances are more readily absorbed in a state of debility and disease than in the vigor of health—a supposition by no means countenanced by experience. Dr. Klapp, in a conversation which I had with him on this subject, suggested that the effects of nausea in favoring the operation of mercury, may be referred to the obvious tendency which sickness of the stomach has to determine the circulation to the salivary glands, and to excite their secretory action, as is shown to be the case by the increased flow of saliva which commonly takes place during nausea. There is undoubtedly a very intimate connection between the stomach and the glands of the mouth, and it is not improbable that, through this relationship between these organs, nausea may produce the effects which are here ascribed to it.† In relation to this subject, Dr. A.

* Pharmacologia, p. 115. Lond. 3d edit.

† This practice of combining nauseating doses of emetic substances with mercury, for the purpose of expediting its salivant operation, was employed by Dr. Klapp several years before Dr. Paris's observations on this subject

W. Ives makes the following observations, which are worthy of much attention: "Cutaneous perspiration has such an intimate connection with, and dependence on the circulation, that it is, perhaps, the best criterion of the susceptibility of the system to mercurial action. I have never known ptyalism produced in fever where the skin was perpetually dry, and even in diseases unattended with febrile excitement, I have generally been able to form a correct prognosis of the effects of mercury from the state of this secretion. Hence the importance of combining antimonial preparations with calomel."* Whether, however, we can offer a satisfactory explanation of the fact in question or not, its practical consequence is not the less obvious and important; and from what I have myself seen, and learned from others on this subject, I am well satisfied that this practice will in general enable us, better than any other means with which we are now acquainted, to overcome the insusceptibility which we occasionally meet with in patients to the specific action of mercury.

Mercury may prove remedial:—

1. By producing a new and peculiar excitement in the system, and thereby overcoming the previous morbid excitement, on the principle suggested by Hunter—that two different diseases cannot exist in the body at one and the same time, unless they exist in totally different structures. It is in this way, probably, that mercury removes diseases, when exhibited in such doses as to produce no sensible evacuations or affections of the system.

2. By equalizing the circulation, and thereby removing local congestions. It is by an effect of this kind that mercury, in general, acts so beneficially in fevers of a congestive character. "The power which calomel has," says Dr. Armstrong, "in equalizing the circulation, is nowhere more conspicuously displayed, than in diseases of a congestive character. Before its exhibition the skin will be cold, wan and shrunk, the pulse feeble or oppressed, and the whole system apparently relaxed: but as soon as the mouth is made sore from its influence, the skin becomes warm, reddish, and distended with vigorous circulation, while the pulse is full, soft, and strong, and the general energy in a great measure restored."

3. By establishing an afflux to the inflamed glands of the

were published. I have before me an account of four cases, transcribed from the case-book of the Alms-House Infirmary of this city, in which Dr. Klapp exhibited small doses of ipecacuanha with calomel, for the express purpose of facilitating its effects upon the salivary glands. These cases occurred in the year 1819.

* Appendix to Hamilton's Observations on the Use and Abuse of Mercurial Medicines, p. 210.

mouth, from the neighboring parts. It is in this way, in part at least, that salivation proves serviceable in hydrocephalus, diseases of the breast, &c.

4. By exciting discharges from the bowels and the various excretory glands of the body. Hence its utility in dropsy, dysentery, hepatitis, &c.

Having premised these general observations on the employment of mercury, I shall next proceed to a particular consideration of its therapeutic application; and in the last place give an account of its various preparations, and the peculiar remedial purposes to which they are applicable.

Mercury was for a long time almost entirely confined to the treatment of chronic diseases. About the middle of the last century it was introduced by some of the New England practitioners as a remedy in acute inflammatory fevers; and soon afterwards, Dr. Robert Hamilton, of Lyn Regis, in England, published his valuable observations on the efficacy of calomel and opium in inflammatory diseases.

Latterly, mercury has become a very common remedy in acute disorders; but even at present its powers in these affections are perhaps too little attended to by the profession in general. Dr. Armstrong, upon whose judgment much reliance is to be placed, observes, in relation to this subject, "calomel is a medicine far too much given in chronic, and far too little in acute diseases; for, while, when administered with due discrimination, I have never known it prejudicial in acute diseases, many instances have been presented to me where it seemed to have broken up the health in chronic diseases." The result of his experience with this remedy is very strongly in favor of its powers in diseases of high arterial excitement or venous congestions; and the testimony of many other practitioners of great celebrity might be adduced in behalf of this practice.

It appears to be admitted, pretty generally, that mercury is most efficacious in fevers attended with disorder of the biliary organs, and hence we find it most commonly recommended in the autumnal fevers, or those arising from marsh exhalations.

A great deal has been said both in praise and in condemnation of the employment of mercury, in yellow fever. From my own experience I can say nothing concerning its powers in this disease; but much respectable testimony is decidedly in favor of its utility in this endemic scourge of hot climates. It was very early employed by some West India practitioners in this disease. The credit, however, of having first extensively used this remedy in yellow fever, and raised its reputation in this respect, is undoubtedly due to Dr. Chisholm. Soon after the mercurial practice was brought into particular notice in the yellow fever of the West

Indies, it was adopted and zealously advocated by Dr. Rush and others in the treatment of this disease, as it occurred among ourselves in the year 1793. It appears to be the opinion of those who speak most in favor of the mercurial practice in this disease, that it acts most efficaciously when given in very large and frequently repeated doses, so as to bring the system under its specific influence as speedily as possible. By exhibiting large doses of calomel at short intervals, the combined advantage of its cathartic and early specific operation will be gained; and experience would seem to demonstrate that this practice, if promptly and decisively employed, will sometimes arrest the disease in its commencement, and recover patients that would, perhaps, under a more gentle treatment, be lost. Dr. Bancroft, however, considers the influence of mercury of very doubtful efficacy. He thinks "that where persons have recovered from the yellow fever after having been salivated, their recovery was not occasioned by salivation, but was the consequence of such a condition of the powers of life, and of the functions connected therewith, as induced a mitigation of the disorder."

In the treatment of our autumnal bilious fevers, mercury, carefully employed, is a remedy of much importance. I have often observed, that as soon as a tenderness of the gums came on from the employment of mercurial purges in this disease, the symptoms began to decline, and convalescence was speedily induced. I have seldom, however, administered calomel in any other way in bilious remittent fevers, than in purging doses; nor does it appear to me proper to push its constitutional operation further than merely to give evidence of its influence by a slight soreness of the mouth.

In obstinate intermittents mercury is a remedy of very great power. I have succeeded in curing cases of this disease in a short time, by the use of calomel, so as to affect the mouth, after bark, arsenic, together with bleeding and blistering, had been vigorously and very perseveringly employed without the least advantage. Mercury is particularly applicable to those cases of intermittent fever that are connected with obvious symptoms of visceral disorder, especially obstructions of the liver, spleen, &c.

Calomel has also been much praised by some writers in the cure of typhus fever. Dr. Rush found the pulse becoming full and slow, and succeeded by evident amendment, in typhus mitior, on the supervention of salivation. Dr. Warren, also, observes, that in cases of typhus where the debility had become very great, and in which wine and bark had been ineffectually used, "a few doses of calomel excited the system to action, and the patient began immediately to recover."* But the efficacy of this remedy

* A View of the Mercurial Practice in Febrile Diseases, p. 17.

appears to me more conspicuous in that variety of typhus which Dr. Armstrong calls the congestive form of the disease. This writer states that he generally gave it in a scruple dose at first, in its early stages, so as to procure full alvine evacuations, and obtain the alterative effects of the medicine as early as possible. It appears, indeed, from the testimony of Chisholm, Johnson, Armstrong and others, that the specific influence of mercury is peculiarly beneficial in every species of congestive fever. "For a long time," says the latter writer, "I overlooked one of the principal effects of calomel in congestive fevers, and at last it was only forced upon me by patients almost invariably recovering with rapidity, when ptyalism was excited. The power which calomel has in equalizing the circulation, is nowhere more conspicuously displayed than in diseases of a congestive character. Before its exhibition, the skin will be cold, wan and shrunk, the pulse feeble or oppressed, and the whole system apparently relaxed, but as soon as the mouth is made sore from its influence, the skin becomes warm, reddish and distended with the vigorous circulation, while the pulse is full, soft and strong, and the general energy in a great measure restored. The liver is intimately concerned in the pathology of congestive fevers, and for the first day or two, the alvine evacuations (from calomel) will commonly be found either as dark as tar, or whitish and slimy; but they speedily become natural when ptyalism takes place, and a copious secretion of bile almost invariably augurs a favorable issue."* In the typhoid fever, which prevailed among the blacks in the suburbs of this city during the preceding two summers, I have seen the good effects of calomel strongly illustrated. In several cases of this fever, evincing a highly congestive condition of the internal organs, I obtained the most decided advantages from large and frequent doses of calomel. As soon as the gums became sore, the tenderness in the epigastrium, of which they invariably complained, began to decline, and the other symptoms gradually receded.

In the acute phlegmasial fevers, mercury is also a remedy of very considerable importance. It must be observed, however, that it can rarely be given with advantage, or even propriety, in affections of this kind, without the previous or concomitant use of the lancet or other antiphlogistic and depletory measures. With such precautions, it may be resorted to in some of the phlegmasia with very great advantage. In these diseases the calomel should, in general, be given in such doses as to procure its purgative and specific operation at the same time. "In such affections," says Dr. Armstrong, "the shortest and most certain way

* Armstrong on Typhus, Am. edit., p. 167.

of procuring the specific, is through the purgative operation of calomel, for the high excitement resists the agency of calomel, and the intestines are usually so lined with morbid mucus as to prevent its absorption, unless this mucus be brushed away, by purging, from the mouths of the absorbent vessels. One large, or two tolerably free doses of calomel, therefore, may be administered in the day, followed up by some other aperients, to induce plentiful evacuations before bed-time, while to accelerate its more complete absorption during the night, it may be given in divided doses, combined with opium, where there is pain in the chest or belly, or much general irritation. It must also be observed, that ptyalism is excited with much difficulty during the unabated violence of fever; and that while the skin is hot and dry, and the pulse quick or tense, calomel may be given with freedom, without the fear of producing inordinate affection of the mouth. When, however, the fever is somewhat moderated, calomel must be much more cautiously given, because as the system is then verging towards its natural state, its specific action will be more readily induced; and where, during the continuance of the fever, it either acts freely on the skin or kidneys, while it keeps the bowels soluble, the practitioner need not be impatient about the appearance of ptyalism; for the modus operandi of calomel is to equalize the distribution of blood, to restore the natural balance of the circulation, by communicating a power to the capillary system of vessels which enables them to resume their secretory offices as before."*

Of the great efficacy of mercury in hepatitis, there can now no longer be any doubt. Its employment in this disease originated in the East Indies, and was introduced into England about the year 1764, by Dr. Robert Hamilton, of Lyn Regis.† In the beginning of the acute form of this disease calomel should be given in large doses, with a view principally to its purgative effect, and ought always to be premised and accompanied by bleeding, both general and topical, and epispastics over the region of the liver. When the more violent symptoms of inflammatory excitement are subdued, it will, in general, be highly useful to produce a gentle mercurial action in the system. In the chronic form of this complaint there is no treatment equal to a proper mercurial course. In this, however, as well as in all other chronic affections in which it may be thought proper to give mercury, it should be administered in minute doses, so as to affect the system very gradually. Dr. Ayre and Dr. Armstrong dwell particularly

* Armstrong on Typhus, p. 338.

† Letter from Dr. Hamilton to Dr. Duncan, in the Medical Commentaries for the year 1783–84, vol. ix. p. 191.

on the importance of attending to this mode of administering mercury in chronic diseases. In this respect the former of these authors has introduced a very valuable improvement in the use of calomel in chronic affections of the liver.

Mercury has also been much commended for its powers in pulmonary inflammation. Dr. Robert Hamilton, whose paper I have already quoted, states that he employed calomel and opium in peripneumony with astonishing good effect. This combination, he observes, eased the perspiration, promoted the discharge of bronchial mucus, and acted like a charm in allaying the cough and general irritation. He also gave calomel and opium with great advantage in pleuritis, rheumatism, and other inflammatory affections. Dr. John Warren, professor of anatomy and surgery in the University of Cambridge, relates cases of pneumonia in which calomel with opium was employed with exceedingly good effects.* From my own experience, I can say nothing of this practice; it is not at all unlikely, however, that, after the violence of the inflammatory symptoms has been moderated, opium and calomel in small doses, may be very serviceable. The employment of calomel in cynanche trachealis originated, I believe, with the physicians of this country. We are informed by Dr. John Archer, of Maryland, that, in conjunction with polygala seneka, he used calomel freely in this disease. Dr. Rush also placed considerable reliance on the efficacy of this medicine in that species of cynanche trachealis which he denominated the *humid.* He directs it to be given in large doses in the very commencement of the disease, and afterwards in smaller doses, until the symptoms disappear. When given in this way, he observes that the bark is hardly a more certain remedy in intermittents than calomel in this form of croup. Two Scotch physicians, Dr. James Anderson and Dr. Hamilton, both of Edinburgh, have published accounts of their success with this remedy in croup. The former gave calomel to the extent of eighteen grains in twenty-four hours, in doses of two or three grains every hour to children three years old: and he affirms that out of seven cases thus treated, not one died. Some years ago, Dr. Stearns, of Albany, published an interesting paper on the use of very large doses of calomel in this disease. Instructed by the observations of Dr. Stearns, I have since employed a similar practice with much success. Instead of the ordinary emetics, I give from fifteen to twenty grains of calomel to a child from two to five years old, at once; this hardly ever fails to excite copious emesis, and acts at the same time briskly as a cathartic. The nausea and relaxation produced by the calomel, are of much longer continuance than that which

* A View of the Mercurial Practice in Febrile Diseases, p. 152.

attends the usual emetics. After the inflammatory symptoms of this disease have abated, it sometimes assumes a somewhat chronic character, attended with a dry hoarse cough, and difficult respiration. When the disease acquires this disposition, calomel and ipecacuanha in small doses, repeated every three or four hours, is of essential service. It must be confessed, however, that it would be wrong to place any great reliance on this, or any other medicine, in this rapid and dangerous affection, without the concomitant employment of other means, and above all venesection, even to deliquium in very violent cases, as directed by Dr. Ferriar. The quantity of calomel recommended by Dr. Stearns and myself, in this disease, is, however, nothing when compared to that administered by Dr. Hamilton of Edinburgh. He states that he gave above a hundred grains in twenty-four hours, to a child only two years old; and by this practice he "completely succeeded both in curing the disease and in preventing any shock to the child's constitution, in every case where it was employed previous to the occurrence of the lividness of the lips and other mortal symptoms." I would not, however, recommend so bold a practice as this; but on the contrary regard it as rash and hazardous.

Mercury has also been given in cynanche maligna. Dr. Warren describes a putrid sore throat prevalent at Boston in 1735, in which calomel was freely employed by some practitioners, and, it is stated, with very good effect. "When the disease did not prove fatal on the second or third day, it was almost universally attended with great erosion and excoriation about the fauces, inside of the mouth, lips, and chin, and wherever the saliva lodged; and these parts became covered with a white aphthous slough, painful and corrosive. In these cases calomel given freely and liberally was the only medicine which could be depended on to stop the progress of the erosion." In subsequent epidemics, however, this practice was not found equally serviceable. In the scarlatina anginosa, which prevailed in this city in 1783, Dr. Rush gave calomel in small doses in every stage of the disease.

In chronic inflammation of the bronchia, calomel and opium are often of much service. Dr. R. Hamilton greatly extols the powers of this remedy in this affection. Dr. Armstrong, though satisfied of the occasional utility of opium and calomel in chronic bronchitis, speaks, however, with more distrust of its powers in affections of this kind. "Cordially," he says, "as I join in the general and strong commendation of these two agents, preceded by evacuants, in acute inflammations, it is only justice to confess that they have not unfrequently disappointed my expectations in chronic ones; yet where the ordinary measures fail, they certainly deserve a fair trial even in simple inflammation of the

bronchia; though the opium should be moderately administered, and mostly along with camphor and antimony."*

Much was at one time said concerning the efficacy of mercury in pulmonary consumption; and a considerable number of cases are reported in the periodical journals both of Europe and this country, in testimony of its utility in this almost hopeless malady. Dr. Samuel Akerly, of New York, in a letter to Dr. Rush, gives an account of four cases of pulmonary consumption which were cured by salivation;† and Dr. Rush himself mentions his success with mercury in this disease. In the fifth volume of the American Medical Recorder, there are three cases related by Dr. John Gloninger, of Lebanon, in which this remedy was successfully resorted to. For my own part, however, I am much inclined to doubt whether mercury has ever been of any real service in genuine tubercular consumption, and it is not improbable, I think, that the cases, which have been mentioned as having been cured by this remedy, were of that variety of the disease which has of late attracted considerable attention, and described by Dr. Wilson Philip and others under the name of "dyspeptic phthisis." This form of consumption is generally preceded by symptoms of indigestion, but particularly those which indicate a disordered state of the hepatic system. "Contrary to what is usual in other species of the disease, the spirits from the beginning are generally more or less depressed, and the countenance sallow."‡ The cough is first dry, and comes on in violent fits, commonly after a full meal or on lying down. The matter is generally thrown up in astonishing quantities. There is, for the most part, but little or no pain felt; if there is any experienced, it is usually "a dull pain in the pit of the stomach, or pretty low down in the left side of the chest." The diagnosis of dyspeptic phthisis, says Dr. Philip, does not, however, rest merely on the modification of the symptoms common to all the forms of this disease. There are other symptoms present by which we may generally, with little difficulty, distinguish this variety of consumption. These symptoms are flatulence, acidity, furred tongue, impaired appetite, and irregular bowels. In this variety of the disease, mercury, with mild tonic remedies, is of primary consequence. It must not, however, be given so as to excite salivation; on the contrary, it ought to be introduced into the system very gradually, and pushed no further than merely to produce a slight tenderness of the gums. One or two grains of the blue pill, with some tonic bitter, may be given once or twice in twenty-four hours. "There is no disease," says

* Practical Observations on Scarlet Fever, &c., p. 276.

† Coxe's Medical Museum, vol. iii. p. 198.

‡ A Treatise on Indigestion, by A. P. W. Philip, M. D., p. 300.

Dr. Philip, "in which the advantages of minute doses of mercury are more conspicuous than in this: as the tenderness of the epigastrium abates, and the state of the alvine discharges improves, in by far the majority of cases the pulmonary symptoms gradually disappear."

There can hardly be any doubt of the utility of mercury in incipient phthisis depending upon a syphilitic taint. But even here it is only in the early stage of the complaint that this remedy can be employed with any prospect of success.

Mercury has also been much recommended by some, in the cure of rheumatism, both chronic and acute. In the latter form of the disease, Dr. R. Hamilton employed calomel and opium with much success. The use of calomel in acute rheumatism is, however, certainly a practice of very doubtful efficacy; and unless as a purgative, or in cases occurring in the miasmatic districts, and attended with symptoms of biliary disorder, is but seldom employed in the present practice. In chronic rheumatism mercury is a remedy of acknowledged efficacy. Dr. John Otto, a very intelligent practitioner of this city, in an excellent paper on the cure of chronic rheumatism, published in the Eclectic Repertory,* says, "The result of my experience in the Pennsylvania Hospital is, that every form of chronic rheumatism, in almost every instance, is removed during the ptyalism, if it be carried to a considerable extent; that the exceptions are very few where there is not permanent relief obtained: and that, in a vast majority of cases, a complete cure is effected if the salivation has been continued actively three or four weeks." Opium is an excellent auxiliary to calomel in this disease; it allays irritation and pain; and prevents it from acting too violently on the bowels, a copious discharge from which is generally injurious in cases of this kind. In that variety of rheumatism which is brought on by imprudent exposure to cold, while under the influence of mercury, our best remedy will, in general, be a second mercurial course. "I have, in every case of this kind," says Dr. Scudamore, "seen that all the ordinary methods of treatment are of no avail, or afford only palliative, and very temporary relief; but I have invariably had the satisfaction of witnessing the cure to be effected by resuming a well conducted course of mercury."†

In some varieties of ophthalmia, mercury is a remedy of great powers. Mr. Travers observes, that in certain habits simple ophthalmic inflammation, whether local or constitutional, "becomes worse under the usual depletory measures, the irritability increasing as the strength fails. When this is the case, calomel,

* Vol. ix. p. 530.

† Scudamore on Gout and Rheumatism, p. 316.

opium and antimony are our best remedies."* When there is opacity of the cornea, in strumous ophthalmia, "calomel," says the same writer, "or the blue pill, or the oxymuriate of mercury, should be exhibited in combination with opium so as slightly to affect the system. The efficacy of the mercurial remedy mainly depends on its combination with opium." Mercury is no less useful in sclerotitis; but in no form of ophthalmia is this medicine more decidedly beneficial than in choroid and iritic inflammation. After dwelling on the employment and action of mercury in inflammatory diseases of the eye, Mr. Travers observes: "But if any two facts are well established in modern practice, I apprehend they are these:—first, the power of mercury to arrest acute membranous inflammation, both prior to and after the effusion of adhesive matter; and secondly, its power rapidly to remove by an excitement of the absorbent system peculiar to itself, the newly adhesive matter. If these facts be admitted, then the propriety of its use is indicated in iritis, as in carditis, pleuritis, peritonitis, and the only practical question that can arise respecting it is, how far the patient's strength is equal to support the remedy. There are, I admit, states of the organ as well as of the constitution in which it cannot be borne, and no sooner is its influence felt than the inflammation threatens disorganization; and if the plan be persevered in, quickly runs on to it."

By the writers on the diseases of hot climates, mercury has been much recommended as a remedy in dysentery. Cleghorn gave calomel and opium combined in the evening, and a purgative draught in the morning. This, he observed, hardly ever failed to bring off "a prodigious quantity of round, hard, fetid lumps, to the great relief of the patient." It does not appear, however, that he employed mercury in this disease with a view to its salivant operation. By some of the late writers on the diseases of the East Indies, calomel is more exclusively and confidently recommended in this disease.

Dr. James Johnson gave it in "scruple doses," two, three, or four times a day, and although he admits that "the first stage of dysentery cannot be treated on principles too strictly antiphlogistic, he contends that when the second stage has commenced, or, in other words, when the previous increased action has ended in congestion, nothing can be more useful than to saturate the system with mercury. This mineral does more to resolve irritative fever, to equalize the circulation, disgorge the capillary vessels, restore the balance of the nervous power, and open the sluices of the various healthy secretions and excretions, than any other remedy with which I am acquainted."† This practice, Dr.

* A Synopsis of the Diseases of the Eye, &c., p. 253.

† Johnson on the Influence of Tropical Climates, 3d edit., s. 220.

Robertson observes, is, however, only adapted to tropical climates, "for there the human frame is much less susceptible of the action of mercury, and consequently will bear much larger doses of that metal than it would be prudent to prescribe in the climate of England." Dr. Bampfield,* though averse to such Herculean doses of this medicine, speaks, nevertheless, decidedly in favor of mercurial remedies in this disease as it occurs in tropical climates. "In my note-book," he observes, "it is stated, that more than fifteen months had elapsed after my arrival in the East Indies, before one fatal case occurred in the course of which ptyalism had been fully induced and supported." In the inflammatory form of this disease, calomel should not be given with a view to its specific effects, until the high febrile excitement be previously moderated by bleeding, purging, and other antiphlogistic measures. When this has been effected, calomel, Dr. Bampfield observes, may be resorted to with various and very important intentions; "as a cathartic, to empty the intestines of their feces, and to excite an increased secretion from the healthy portions of the mucous membrane, to emulge the portal circle; to excite the salivary glands; and, which is the most important as a general stimulus to the system, to excite increased secretions generally, and a mercurial fever or irritation that supersedes inflammatory actions." There are other writers, besides those already mentioned, who speak equally strong in favor of very large doses of mercury in tropical dysentery. In the dysenteries of the middle latitudes, mercury requires a much more cautious use. After the inflammatory excitement is moderated, and there exists much intestinal irritation, with a dry and hot skin, there is no remedy better calculated to afford relief than calomel, ipecacuanha and opium. Except, however, in the chronic form of the disease, I have seldom found it necessary to excite ptyalism. A slight affection of the mouth has, in general, been sufficient in my practice to afford relief.

In diarrhœa, calomel, judiciously managed, is a remedy of great efficacy. In minute doses it allays morbid intestinal irritation more readily than any remedy we possess. Dr. Ayre, of Hull, in his very excellent treatise on marasmus, has fully set forth the value of small doses of calomel in this and other similar intestinal affections. I can myself speak with much confidence of this practice. Within the last three years I have relied almost exclusively on minute doses of calomel in the treatment of this complaint, and I do not remember of having been disappointed, in a single instance, in putting a stop to it. I commonly give one-fifth or fourth of a grain of calomel with an equal quantity of

* On Tropical or Scorbutic Dysentery, p. 135.

opium, every two, three or four hours, according to the urgency of the symptoms. The use of minute doses of calomel is very strongly recommended by Dr. Ayre, in cholera. In that variety of this complaint which is peculiar to infants, I have been for several seasons past much in the habit of giving small doses of this remedy; and I have had reason to be pleased with its effects. I usually give from one-eighth to one-fourth of a grain with three or four grains of prepared chalk, every hour or two. I do not, however, rely exclusively on this remedy, but always direct the occasional use of the warm bath and rubefacient remedies to the surface. The late Dr. Miller, of New York, mentioned the efficacy of this practice in cholera long before the appearance of Dr. Ayre's book, to whom the credit of having first employed the remedy in this way, is now commonly ascribed. To Dr. Ayre, however, we are indebted for a very ample and interesting view of the usefulness of this practice. In the cholera of adults he gave from one-sixth to one-third of a grain of calomel every half hour; and he relates a number of cases which were speedily relieved by this treatment.

Colica pictonum is another disease in which the efficacy of mercury appears to be well established. So thoroughly, indeed, am I satisfied of the utility of this practice, that I rely entirely on large doses of calomel and opium, together with bleeding, where the arterial excitement is vehement. I do not remember a single instance in which the bowels did not really give way to the action of an ordinary cathartic, as soon as the mouth became affected by the mercury. For the more chronic effects of the poison of lead which show themselves in paralysis of the wrists, shooting pains through the abdomen, pale and haggard countenance, &c., there is certainly no remedy equal to mercury, given to the extent of exciting salivation. Dr. Clutterbuck, in his excellent work on the deleterious effects of lead, places the utility of this practice in a very strong light.

In dyspepsia, when, from long continuance, functional disorder of the liver is induced, mercury, judiciously administered, is a remedy of very great consequence. The blue pill, in doses of four or five grains in the evening, and aided by occasional mild laxatives, tonic bitters, and a proper diet, will, in general, act very beneficially. Here, however, salivation is to be carefully avoided; the slightest affection of the mouth, so as to give evidence of the alterative influence of the medicine, is all that is requisite from mercury in this complaint.*

Being closely connected with indigestion, hypochondriasis may here be mentioned as a disease sometimes considerably benefited

* Wilson Philip on Indigestion.

by mercurial remedies. Given as a purgative in conjunction with other cathartic remedies, it does much good in this disease by exciting the healthy action of the liver, invigorating the portal circulation, and emulging the biliary vessels. With these intentions, the following pill may be used to much advantage.* This cathartic generally produces large bilious evacuations, frequently of the consistence and color of tar, and which are almost invariably followed by great relief to the distressing hypochondriac symptoms.

A good deal has been said, both in Europe and in this country, concerning the efficacy of mercury in the cure of mania. Dr. Rush frequently employed salivation in mental diseases in the Pennsylvania Hospital, and occasionally with much advantage. "Too much," he observes, "cannot be said in its favor in general madness." At present mercury is much less resorted to in mania than it was formerly. It is, however, a remedy well worthy of attention in the treatment of this disease; more especially in those cases which depend on, or at least are intimately connected with, deranged function of the hepatic system† or alimentary canal.

Mercury has also been successfully used in tetanus. Dr. Rush cured a case of this disease in the Pennsylvania Hospital, by salivation, aided by bark and wine. Walthers, a German writer, says a great deal in favor of salivation in this disease.‡ Munro also gave mercury successfully in tetanus; and Dr. Joseph Klapp, of this city, has reported a case of this disease in which salivation, with the cold bath, effected a cure. Mercury has often been given in conjunction with opium in this disease. Dr. Odier, of Geneva, says, that he has known these agents, given in very large doses, to produce very good effects in tetanus.§ Mercury is supposed to be more efficacious in idiopathic tetanus, than in that variety which proceeds from mechanical injuries. It is doubtful, however, whether any real distinction exists in the essential character of idiopathic or symptomatic tetanus, and I am inclined to believe, with Dr. Morrison, who has lately published a treatise on tetanus, that the general treatment, in these varieties of the disease, cannot be distinct. Dr. Morrison observes, that spontaneous salivation has not unfrequently been noticed "in tetanic patients, where cases terminated favorably, and hence probably

* Extract. colocynth. comp. ʒi; calomel gr. xv; antim. tart. gr. ii; ol. carui gtt. v. M. ft. In pil. xxiv dividend. cap. ii vel iii quaque nocte. This pill is much praised by Drs. Johnson and Scudamore, in hepatic disorders.

† Kæmpff, Hufeland, Prost, Burrows, Pinel, &c.

‡ Observations on the Curative Powers of Mercury in Tetanus. Abhandlungen aus dem gebiete der Pr. Med., B. i. s. 166.

§ Manuel de Médecine Pratique, p. 189.

the first idea of using mercury."* "I have undoubtedly had many examples," says this writer, "of the good effects of mercury in the cure of this disease. Four grains of calomel, given two or three times a day, with three or four drachms of the ointment, well rubbed on the neck and spine night and morning, I believe to be an excellent practice. A much larger quantity of ointment may be used on different parts of the body: indeed, the more continued the friction, the better." Dr. Clark advises a slight mercurial salivation, after wounds in hot climates, as a means of preventing the occurrence of this disease.

Of the remedial powers of mercury in hydrophobia, nothing can be said calculated to excite any well grounded hopes. It is true, it has been confidently recommended by many writers of great eminence in the profession.† Bonel‡ even states that he cured five hundred hydrophobic patients by mercury. This is quite equal to the reports that have been recently published concerning the powers of scutellaria in this disease, and deserves not the least credit. Unfortunately we know as yet of no remedy or course of treatment which holds out even a ray of hope in this dreadful malady. The immediate excision of the part bitten by the rabid animal is undoubtedly the most promising mode of preventing the occurrence of the disease. But to be effectual it should be done directly after the bite is inflicted; by this means we may prevent the absorption of the virus, and the consequent evolution of the disease. Dr. Chapman says: "I am thoroughly persuaded that the extirpation of the part, at any period prior to the accession of the attack, would prove as effectual as if it had been done when the bite was originally inflicted." This persuasion, however, does not appear to be founded upon any experience, but derived solely from his speculative views concerning the modus operandi of the hydrophobic virus, which, according to his notions, is by the poison exciting a train of "associated motions, the primary link of which commences at the original seat of irritation." By breaking this train of morbid actions, at any time anterior to the full development of the disease, he thinks we shall be able to prevent its full formation. It may be observed, however, that although the primary link of such a train of morbid actions be destroyed, yet the consecutive ones being already formed, would still remain and progress to their ultimate point. But speculation apart, we know from direct experiment that the

* Johnson on the Influence of Tropical Climates, p. 474.

† Portal, Johnson, Astruc, Desault, Sauvages, Haag, Cheyne, Walthers, Kaltschmidt, and others.

‡ Burdach's Arzneimittellehre, B. ii. p. 268.

extirpation of the bitten part has failed in preventing the accession of the disease. Dr. Hosack mentions a case of this kind.*

In dysphagia mercury has been known to produce very good effects. D. Munkley† relates a remarkable case of dysphagia in which the remedy was successfully employed. The patient, a woman, about forty years old, complained of an inability to swallow; whatever she attempted to swallow, after staying some time in her throat, was thrown up again, by what appeared, from her description, a kind of convulsive motion of the œsophagus. She could swallow nothing but very liquid diet, and this only in very small quantity. A gentle salivation, continued for about six weeks, cured her effectually. The writer alludes to other cases of this kind, in which mercury was successfully used. "The only medicine," he says, "from the use of which I have ever found any service in this complaint, is mercury; and in cases which are recent, and where the symptoms have not risen to any great height, small doses of mercury given every night, and prevented by purgative medicines from affecting the mouth, have accomplished the cure; but where the complaint has been of long standing, and the symptom has come on of the food's being returned into the mouth, in the manner above described, a more powerful method of treatment becomes necessary. In this case I have never found anything of the least avail in removing any of the symptoms but mercury used in such a manner as to raise a gentle but constant spitting."

Dr. Thomas Percival also relates a case of difficult deglutition, in which mercury, together with bark and antispasmodics, effected a cure.‡ There are other writers who speak of their success with this remedy in dysphagia.

Many authors§ speak very highly of the powers of mercury in gutta serena. It is said to be particularly serviceable in those cases which are connected with internal ophthalmic inflammation, and in which, therefore, the pupil is in a very contracted state. Mr. Ware strongly recommends mercury in cases of this kind; and Mr. Stevenson observes, that it may be exhibited with much advantage during the active stage of the disease, "so as to produce an early constitutional effect, for it will tend not only to alter the morbid action of the vessels, but will serve, likewise, after the inflammatory symptoms have subsided, to promote the absorption of any lymph that may have been effused during the preceding violent vascular excitement."‖ In the chronic form of this dis-

* Thacher on Hydrophobia.

† Medical Transactions of the London College of Physicians, vol. i. p. 172.

‡ Ibid., vol. ii. p. 90.

§ Bisbane, Kock, &c.

‖ Stevenson on Amaurosis, p. 208.

ease, mercury may be useful by removing visceral obstructions, which are not unfrequently the primary source of this affection.

In dropsy, mercury is a remedy of acknowledged efficacy. I have already spoken of the modus operandi of this remedy in hydropic diseases, when treating of the Diuretics, and shall not, therefore, in this place, say anything further on this point. In union with squills, calomel given so as slightly to affect the mouth, generally acts with great efficacy in hydrothorax. When squills are inactive as a diuretic, as is sometimes the case, the addition of a grain of calomel every night until the salivary glands become affected, very commonly determines it to produce a copious diuresis.* In exhibiting mercury in dropsy, it is of much consequence to attend to those circumstances which experience has pointed out as being favorable or opposed to its remedial operation. Thus it is stated by Maclean, Blackall and others, that "some firmness of the general habit" is to be regarded as a favorable circumstance to the action of mercury in dropsical affections. On the contrary, as Dr. Blackall observes, "if the habit is so depraved that the coagulable part of the blood already passes off by the kidneys, the operation of this mineral is obviously very equivocal and hazardous." This corresponds with the observation of other writers, and my own practice has furnished me with several very striking instances of the injurious effects of mercurial remedies in dropsy attended with a depraved and scorbutic habit of body. In cases of dropsy attended with visceral obstructions, particularly those of the liver, mercury will in general prove very serviceable. In dropsies of this kind the urine is commonly very thick, and highly charged with bile and uric acid.

The utility of mercury in hydrocephalus is often very considerable. Percival, Dobson, Rush, Cheyne, and other writers mention cases of this disease which were successfully treated by this remedy. "When the existence of the complaint becomes probable," says Cheyne, "there ought to be no other delay than that occasioned by our endeavor to subdue the disorder in the bowels, in commencing the mercurial course, which, it must be allowed, has cured hydrocephalus even when far advanced."† He gives an account of two cases in which the efficacy of mercury is put in a very strong light. It is to be observed, however, that bleeding, both local and general, with purging and blistering, ought never to be omitted as collateral and very important resources. Calomel may at first be given as freely as the stomach will bear with a view to its purgative effects; when the bowels

* Blackall on Dropsies, p. 44.

† Cheyne on Hydrocephalus, p. 96.

are once thoroughly evacuated, it ought to be given in small and frequent doses, and employed at the same time externally by frictions. By a course of this kind I have in a few instances succeeded in recovering patients from what I conceived to be hydrocephalus, after they appeared to be in almost a hopeless state. It must be confessed, however, that there is some reason to suspect that other diseases of children, particularly the infantile remittent fever, and mere cephalic congestion from abdominal irritation, connected with fever, are not unfrequently mistaken for genuine hydrocephalic disease; and it may thus be that some of the cases of this disease which are stated to have been cured by this and other remedies, were in reality not hydrocephalus, but other affections connected with inordinate determinations to the vessels of the brain.* Dr. Underwood and Dr. Blackall say nothing in favor of this remedy in the treatment of hydrocephalus. The weight of testimony is, however, decidedly in favor of its good effects in this disease.

The first employment of mercury as a remedy, was as an external application in cutaneous diseases, and it remains to this day one of our most efficacious means in many of these complaints. It is particularly useful in some of the varieties of scabies, prurigo and porrigo. Internally given, it is seldom of any service in these diseases, but some of them yield very readily to its external employment. The itch is commonly cured without difficulty by mercurial ointment; and in the prurigo podicis, an affection attacking the anus and scrotum, and attended with intolerable itching and stinging, the unguentum hydrargyri nitratis, diluted, is the most efficacious remedy we possess. In another variety of local prurigo, the prurigo pudendi muliebris, affecting the pudenda of women, and occasioning an excessive and insufferable itching about these parts, there is no application more effectual than a solution of muriate of mercury in lime-water, in the proportion of two grains to an ounce of the latter.† Mercury has also been recommended in leprosy and elephantiasis, but it does not appear that its efficacy in these complaints is entitled to much attention.

Scrofula is a disease in which the powers of mercury have been very variously represented. That this remedy is capable of doing much good in the present disease, when judiciously administered, is pretty generally admitted; but its imprudent employment in the

* Dr. Coindet has directed the attention of the profession to a particular aspect of the urine, especially to a micaceous deposition like crystals of boracic acid, and which he believes to be urea. The appearance, he says, is almost peculiar to hydrocephalus, and takes place in the second stage.

† Bateman's Practical Synopsis on Cutaneous Diseases.

advanced stages of the complaint, is often followed by very bad effects. As a general remedy to correct disorder of the chylopoietic organs, mercury, given in alterative doses, generally acts with decided advantage in the early stages of this disease. "The means," says Dr. Lloyd,* "that I would make use of for the accomplishment of this point are the following: if the patient be an adult, and the bowels obstinately confined, I would give him five grains of the blue pill every night, and half a pint of decoct. sarsa. comp. twice a day." Copious purging, observes this writer, ought to be carefully avoided; "we should," he says, "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." He recommends the exhibition of alterative doses of this remedy until the symptoms of hepatic and intestinal disorder, if any exist, be removed.

I have seen very good effects from the employment of muriate of mercury and cicuta, given conjointly in this disease. In several instances, however, where this remedy had removed extensive scrofulous ulcerations, I have known, after some time, the local disease to reappear, and to go on with greater rapidity than at any time previously.

Mr. Abernethy, in his invaluable work on the constitutional treatment of local affections, has given much interesting information concerning the remedial powers of alterative doses of mercury in diseases of this kind. Various diseases, too, of an anomalous character, depending on functional disorder of the hepatic system, are often entirely under the control of mercurial remedies. For much interesting and important instruction on this subject, the reader is referred to the works of Drs. Abernethy, Ayre and Wilson Philip.

I come now, in the last place, to say something concerning the use of mercury in venereal affections.

Soon after this disease was known in Europe, mercury was employed as a remedy for its cure; and although it had, at various periods, to encounter much opposition, the experience of the most eminent of the profession in different parts of the world, gradually established its reputation in this respect, and it became at last almost exclusively relied on in the treatment of this disease.

Within the last ten or twelve years, however, its remedial powers in this disease have been again called in question, and we are told, that both the primary and secondary symptoms of venereal affections disappear under the employment of simple dressings and vegetable decoctions, without the use of mercurial remedies.

* A Treatise on the Nature and Treatment of Scrofula. Lond. 1821, p. 29.

Dr. Ferguson, one of the medical officers of the British army, during the late war on the Continent, observed that the surgeons of the Portuguese and German regiments treated their venereal patients without mercury, and that the disease got well under the employment of the simplest remedies. Mr. Guthrie and Mr. Rose, too, in the year 1815, made a number of experiments on this subject in the military hospitals of England, and in 1815, Dr. Hennen, deputy inspector of hospitals, and Professor Thompson, of Edinburgh, instituted a course of experimental inquiries on the same subject. From these experiments it would appear "that all sores on the sexual parts may be healed without mercury in any form whatever; that where that medicine has not been used, secondary symptoms do not appear in a larger proportion than one in ten; that such symptoms are of a milder nature than similar ones occurring after the use of mercury, and that those secondary symptoms gradually cease, under the very simple treatment of confinement in bed, quiet, and a vegetable diet."

Some, indeed, allege, that mercury is not only unnecessary in the majority of venereal complaints, but extremely injurious in its effects, being apt, as it is said, to bring on tedious and dangerous constitutional affections—swellings and caries of the bones, cutaneous eruptions, ulcerations, pain, debility, emaciation, &c. That mercury, incautiously given, or the imprudent conduct of patients with regard to diet, drink, exposure, &c., while under the influence of this remedy, will often produce very serious consequences, is quite certain; but it should be always recollected, that the abuse of a thing is no argument against the utility of its cautious and seasonable use; and that the most valuable remedies are readily converted into dangerous poisons by improper management. "I am ready to grant," says Dr. Curry, "that, like antimony, opium, and every other active remedy, mercury would do little good if it were not also capable of doing some harm. The knife and the caustic are unquestionably powerful, and in so far may they be made dangerous instruments; but who ever blames the surgeon for employing a sharp knife, or an active caustic, seeing that both the one and the other are to be directed by his eye, and guided by his hand?"*

It would, indeed, appear extremely probable, that the cutaneous eruptions, ulcers, caries, nodes, &c., supposed by some to be so often the result of the use of mercury in venereal cases, do in fact depend on a different cause, since it must be confessed, that in other diseases, as for instance hepatitis, &c., no such consequences follow the use of this remedy, however long continued or largely given. "I beg leave to observe," says Mr. Carmichael, "that I

* Curry's Examination of the Popular Prejudices against Mercury, p. 40.

have not, nor do I believe that any other person has, witnessed ulcers on the skin and throat, and nodes on the bones, from the exhibition of the most extensive courses of mercury in any other than venereal diseases, nor even an eruption except the well known mercurial eczema."*

We have, too, the concurrent testimony of some of the ablest physicians, those who have been most extensively engaged in the treatment of this disease, in favor, not only of the superior remedial powers of mercury in syphilitic affections, but of the perfect safety of its employment under prudent management. "My opportunities of administering mercury," says Dr. Pearson, "have extended to no less than *twenty thousand cases*, and I feel myself fully authorized to assert, that it is a remedy always to be confided in under every form of lues venerea; and when we have only this one disease to contend with, that it is a certain antidote, and as safe in its operation as any other active medicine drawn from the vegetable or mineral kingdom."† Dr. Ballingall, in a most excellent little work on syphilis, observes: "When I reflect upon some thousand cases, both of syphilis and liver disease, in which I have employed mercury, with a hand perhaps too unsparing, and when I think of the health which many of my patients have afterwards enjoyed, I cannot believe that there is any great proportion of human constitutions upon which this medicine exerts the deleterious effects which have been lately ascribed to it." Even Mathias, who has written expressly on the diseases produced by mercury, observes, "when this mineral is administered with prudential reserve, and with discreet knowledge, its effects are blessed, safe, efficacious and permanent."‡

My own limited experience in this disease does not permit me to speak very confidently as to the comparative merits of the mercurial and non-mercurial practice. I have, however, never omitted using mercury in any case, whether of local or constitutional syphilis, and in very few instances have I known constitutional symptoms to come on after the employment of this remedy.

It is not my intention, however, to enter into any particular account of the mercurial treatment of syphilis. Those who wish to gain proper information on this subject will not seek it in works on the materia medica. It will nevertheless be proper, in this place, to mention the means that ought to be adopted as precautionary measures against the morbid effects of mercury when exhibited in this and other diseases. With this view I shall quote the following rules from Dr. Hamilton's work on the use and

* Edinburgh Medical and Surgical Journal, vol. xi. p. 436.

† On the Effects of Various Articles for the Cure of Lues Venerea, p. 114.

‡ On the Mercurial Disease.

abuse of mercurial remedies, as they appear to me to be highly important, and by far too much neglected by practitioners generally.

"The first precaution to be adopted in this climate, during a course of mercury, is confinement within doors, with a regulated temperature of the apartment.

"Secondly.—The diet ought to consist of the mildest possible food, such as preparations of milk and farinaceous matters, with weak animal mucilages. In short, all stimulant food, or drink of every description, ought to be most scrupulously refrained from.

"Thirdly.—If the individual be robust, sixteen or twenty ounces of blood should be drawn from the arm before any preparation of mercury be exhibited. Where, from the delicacy of the patient, blood-letting cannot be advised, confinement within doors, and low diet, should be persevered in for at least a week previous to beginning the mercury, and during that time one or more doses of cooling physic ought to be taken.

"Fourthly.—The mercury ought not to be given in such quantity, or with such activity, as to produce a sudden effect upon the system. This is certainly one of the most important practical improvements, suggested by Abernethy and others, and confirmed by the late experiments; for irreparable mischief was often committed by the hurry with which the system was loaded with mercury. If the other precautions be implicitly adopted, the more slowly the mercury is administered, the more certainly and perhaps, speedily, will the primary sores heal.

"Fifthly.—Salivation is to be guarded against, by lessening the dose or suspending the medicine, wherever the brassy taste in the mouth is perceived. The same measures are to be pursued, if any irritation of the bowels threaten.

"Sixthly.—Some vegetable diluent ought to be drunk in large quantities. The decoctions of sarsaparilla, guaiac, sassafras, &c., answer this purpose.

"Seventhly.—The daily use of the warm bath, where that can be conveniently commanded, is found particularly serviceable.

"Eighthly.—If any irritable feelings occur while under the influence of mercury, the use of the medicine should be instantly suspended, and the most active measures for checking the progress of such complaints ought to be carefully employed. Preparations of camphor, of the spiritus ammoniæ aromaticus, of opium, of cicuta, &c., are severally useful, according to the circumstances of such cases.

"Ninthly.—After the mercurial course is finished, the patient ought to remain within doors for at least a fortnight, improving the diet (though still abstaining from wine and stimulating

liquors), and taking gentle exercise, progressively increasing it according to the return of strength."

It must be confessed, indeed, that thousands have been treated successfully with mercury, without the observance of, perhaps, any of the above precautionary measures. It can, however, hardly be doubted that the neglect of these rules has often been the occasion of much mischief, and that if they were more commonly attended to than they appear to be, we should hear much less of the disastrous consequences of the employment of this remedy than we at present do.

OF THE MERCURIAL PREPARATIONS.

Mercury, as has already been stated, does not appear to possess any medicinal properties in its metallic state. Taken into the stomach, however, it readily passes through the intestinal canal, by its gravity; and is on this account sometimes given to force a passage in obstinate obstructions of the bowels.

It is very frequently found adulterated, either by lead, bismuth, tin, or zinc. "Its impurity is at once indicated by its dull aspect; by its tarnishing and becoming covered with a gray film; by its diminished mobility, in consequence of which its globules are unable to retain the spherical form, and therefore *tail*, as it is technically expressed. Lead is discovered by dissolving it in nitric acid, and adding to the solution water impregnated with sulphuretted hydrogen, when, if lead be present, a dark brown precipitate will ensue; bismuth, by pouring the nitric solution into distilled water, when it will appear as a white precipitate; zinc, by exposing the mercury to heat; tin is detected by a dilute solution of nitro-muriate of gold, which throws down a purple precipitate."*

Mercury is susceptible of a very great variety of pharmaceutical and chemical preparations, the mildest and simplest of which are those which are formed by triturating this metal with mucilaginous, oily, or farinaceous substances. By this process it is divided into exceedingly minute particles, a small portion of which becomes oxydized, and thus rendered active as a remedy.

PILULÆ HYDRARGYRI.—BLUE PILL.

These pills are made by rubbing mercury with viscid substances, until the globules disappear, and the metal assumes the

* Paris's Pharmacologia.

state of a black oxide. The conserve of roses is commonly employed for this purpose, but objections have been made against it on account of its astringency, which Swediaur thinks weakens the powers of the mercury. Mr. Abernethy observes, that the blue pill is uncertain in its operation, and he seems to think that this may depend on the sulphuric acid, which, it appears, is not unfrequently found to exist in the conserve of roses. "It is not improbable," observes Dr. Paris, "that, in making the conserve for sale, some of this acid may be added to brighten the color; and if so, the mercurial pill which is made from it may contain, in varying portions, some of that highly deleterious compound, the subsulphate of mercury." Four grains of the pill, made according to the London and Dublin Pharmacopœia, contain one grain of quicksilver. When we wish to exhibit mercury in this way, and the form of pill is objectionable, it may be very conveniently given in the form of Plenck's mercurial mixture, which consists of a suspension of the quicksilver in a solution of gum Arabic. Plenck's directions for taking this mixture are, to triturate together in a stone mortar one drachm of pure mercury and two drachms of the gum, gradually adding water till the globules are entirely extinguished; half an ounce of syrup and eight ounces of water are then to be added to it. The dose of this is two tablespoonfuls every morning and evening. A part of the quicksilver falls to the bottom, but readily unites again with the water by shaking.

The blue pill is the mildest preparation of mercury we possess; and, in certain diseases or states of the system, is preferable to any of the other mercurial remedies. In general, where we wish to produce a very gradual and gentle mercurial impression, and where the bowels are easily excited into action, the blue pill is an excellent form of employing mercury. There are peculiar constitutions, however, in which this pill is so oppressive that it cannot be taken without great disturbance. "It is remarkable," observes Dr. Wilson Philip, "that the blue pill is so offensive to some constitutions, that I have seen several instances in which it disordered the secretion of bile, even when it was healthy at the time of its exhibition; and in such cases, as far as I have observed, the disordered state of the bile continues as long as it is used."* This, however, is of very rare occurrence; and, as a general rule, we have no remedy which is preferable to, or perhaps even so suitable as the blue pill, wherever it is our intention to rectify the functions of the liver or chylopoietic organs. As an alterative, too, in the treatment of local diseases, kept up by constitutional causes, this pill, as directed by Abernethy, is in general the

* Treatise on Indigestion, p. 204.

best form of employing mercury. When it is exhibited as an alterative, it may be given in doses of from four to six grains once or twice a day. Administered in doses of from gr. x to ʒi, it commonly acts as a gentle laxative.

Formula.

℞.—Mass. pil. hydrarg. ʒss;
G. aloes gr. x;
Tart. antimonii gr. i.—M. Divide into ten pills. One to be taken at night on going to bed, in chronic affections, attended with costiveness and derangement of the biliary organs.

UNGUENTUM HYDRARGYRI.

The mercurial ointment is a most important remedial article, and as it requires much time and labor to prepare it by the ordinary processes in use, pharmaceutists have resorted to a great variety of expedients to facilitate its preparations. In an excellent paper on the preparation of mercurial ointment, by Dr. P. K. Rogers, professor of chemistry at William and Mary's College, Virginia,* he gives the following expeditious process, among several others, for preparing this ointment: "Take an ounce of raw linseed oil, which has been long exposed to the air, and half an ounce of tallow to every pound of metal. First, divide the mercury by triturating it with the oil for one minute; then add the tallow, and triturate for one minute more; lastly, add the proper proportion of suet and lard to make an ointment, and rub the whole for three minutes." A mercurial ointment, inodorous, of a deep blue color, and perfectly bland, yet active, may thus be prepared in five minutes. M. Planchet recommends the oil of eggs as the most useful substance to abridge the labor of making the mercurial ointment. "When mercury is triturated with oil of eggs," say the editors of the London Medical Repository, "which has been kept for some months, although it have no disagreeable odor, the metal in a few minutes spreads over the sides of the mortar in a thin layer resembling the amalgam on a looking-glass; in a few minutes longer all the globules disappear, and after adding the lard and suet, the whole operation, which requires the labor of several days by the usual method, is completed in an hour."‡ Turpentine is very commonly em-

* American Medical Recorder, vol. ii. p. 235.

† Journal de Pharmacie, for 1815.

‡ The oil of eggs can be most readily procured by the following method: "Let any quantity of the yolks of fresh eggs be put into a silver or glass vessel, and dried by the heat of a water-bath until the oil can be expressed from

ployed to expedite the preparation of this ointment, but it is very objectionable, on account of its rendering the ointment irritating; and apt, when rubbed on the skin, to produce "either painful excoriations, or a fiery efflorescence, or a crop of small corymbose tubercles, which require the remedy to be discontinued." It appears, from the researches of Mr. Donovan,* that the mercury exists in two different conditions in the officinal ointment; in its metallic state, mechanically mixed, and in the state of an oxide, combined chemically with the lard; "and that the medicinal activity of the ointment, resides exclusively in this latter portion, the presence of metallic mercury not only being useless, but injurious, by obstructing the absorption of the active compound of the oxide." This gentleman has accordingly introduced a very important improvement in the preparation of mercurial ointment; by directing it to be made with the black oxide of mercury and lard, and combining them chemically, by agitating them together for two hours, at the temperature of about 350° Fahrenheit.† Every ounce of lard, when thus prepared, contains twenty-one grains of the black oxide. Mr. Donovan tried the effects of this ointment on several persons, and found it as efficient as the officinal ointment, which contains nearly twelve times as much mercury; and it can be rubbed in completely, in less than one-third the time required for this purpose when using the common ointment. The use of this new ointment is neat and cleanly, soiling the skin but very little; and where privacy is an object, this is of great consequence. It is also much more economical, and may be prepared with much less labor than is requisite for

the mass in the hand. Put this into a cloth bag, and press it strongly between two plates of pewter, warmed in boiling water. The oil, thrown upon a filter in a funnel heated by steam, will then pass through perfectly clear." The analysis of one hundred parts of oil of eggs, according to M. Planche, yielded ninety-one parts of pure animal oil, and nine of suet.—*Dykeman's Dispensatory*, p. 711.

* Thompson's Annals of Philosophy, for October, 1819.

† "The oxide may be procured by decomposing calomel by a solution of pure potass, or by pouring a solution of the nitrate of mercury into a caustic alkaline solution: this oxide should be at first triturated with a little lard, in the cold, to make the penetration complete, taking care that the lard be quite free from common salt, or else calomel will be the ultimate result; the mixture is now to be submitted to the action of heat, and it is very important to attend to the necessary temperature, for at 212° the oxide and lard will not unite; at 600° the oxide will be decomposed and the mercury volatilized; at 500° and 400° the oxide is partially decomposed, some red oxide being formed and mercury reduced; the proper temperature is between 300° and 320°, at which it should be maintained for an hour, and the ointment should be stirred until cold."—*Paris's Pharmacologia.*

the preparation of the common mercurial ointment. "I consider this discovery," says Dr. Mease,* "with that of dissolving magnesia in aerated water, as two of the most useful modern additions to our previous stock of pharmaceutic knowledge."

This ointment, applied by friction to the surface of the body, produces the same general effects as when mercury is given internally. It in general, however, more promptly excites salivation than any other mode of administering this remedy; and it is also much less apt to weaken the alimentary canal than the other mercurial preparations usually employed internally. In very irritable and weakly persons, however, I have known mercurial frictions to produce colic and diarrhœa, and much disturbance of the digestive organs. According to Mr. John Hunter, mercurial inunction is always to be preferred to the internal employment of this remedy, inasmuch as the skin is much less essential to life than the stomach, and is therefore capable of bearing much stronger impressions than this latter organ. Be this as it may, it is very certain that all the purposes for which a general mercurial influence may be requisite, are to be well answered by this ointment. Inunction is commonly performed by rubbing in from two to three ounces on the inner surface of the thighs, or on some other part where the cuticle is delicate. Where a prompt and efficient impression is required, the quantity of the ointment rubbed in, as well as the extent of the surface to which it is applied, may, however, be greatly augmented.

Besides the diseases, in which mercurial ointment is serviceable, in common with other mercurial preparations, there are some affections in which its remedial powers appear to be particularly useful. In the treatment of erysipelas, it would appear to be a very valuable remedy. Dr. Dean, of Chambersburg, in this state, was the first who made its virtues in this respect publicly known. It appears, from the testimony of this gentleman, and of Dr. Lyttle, that the efficacy of this ointment in erysipelas is very considerable. In conjunction with depletory measures, the application of the ointment to the affected part, generally in a short time relieves the burning pain, heat, and itching of the inflammation.

"Among the various local remedies," says Dr. Dean, "that have been recommended in this disease, and which I have had an opportunity of trying, there are none, I am inclined to think, superior to the strong mercurial ointment. The trials which have been made with it in this part of the country, have also obtained for the ointment the confidence of some of our most respectable physicians."†

* Medical Recorder, vol iii. p. 512.

† Ibid., p. 503.

Dr. Dean also speaks of "an obstinate and troublesome disease of the ears," for which he found the mercurial ointment an excellent remedy. It consists of a severe and painful itching in the meatus auditorius, and is attended with continual "beating and ringing in the ears, and at times with a thin acrid discharge, which excoriates and inflames the parts over which it flows." The ointment must be applied to a cotton or woolen tent, and introduced into the ear.

For the reduction of venereal buboes, it is the most useful remedy we possess. Lentin observes, that both in acute and chronic rheumatic pains, mercurial ointment, mixed with an equal portion of camphor ointment, is a very valuable local application.

HYDRARGYRI CHLORIDUM CORROSIVUM.—HYDRARGYRI OXYMURIAS.—CORROSIVE SUBLIMATE.—CHLORIDE OF MERCURY.

This is a white crystaline mass, diaphanous when recently prepared, without odor, and of an exceedingly acrid and styptic taste.

According to some chemists, it is composed of eighty-two parts of oxide of quicksilver, and eighteen of muriatic acid. Agreeably to the latest views, however, it consists of one proportion of mercury, and two of chlorine, constituting a *bi-chloride* of mercury. It dissolves in eleven parts of cold, and in three of boiling water. It is also readily soluble in alcohol and ether. This latter liquid "has the curious property of abstracting it from its solution in water, when agitated with it." The addition of a few drops of rectified spirit or of muriatic acid greatly facilitates its solution in water.*

Given in small doses, one-fourth of a grain for instance, its effects are those of mercury in general. It is, however, much less apt to excite salivation than most of the other mercurial preparations, and has a tendency rather to increase the perspiration and urine. It is said to be more mild in its operation in cold than in warm latitudes.† If it be taken in larger doses, as from a half to a whole grain, its immediate effects are more violent, producing pain in the stomach, nausea, vomiting, anxiety, and palpitation. In still larger doses, it produces burning heat and blisters in the mouth, throat, and stomach, excruciating colic pains, a continued violent vomiting of frothy mucus, mixed with blood, purging, intolerable thirst, and internal heat, tremors, tetanus, paralysis, cold

* Paris's Pharmacologia.

† Burdach, Arzneimittellehre, Band. ii. s. 360.

sweat, syncope, swelling of the face, mania, and finally death. It sometimes produces violent strangury and aphonia. On opening the bodies of such as have died from the effects of this substance, the mucous coat of the stomach and bowels is found extensively inflamed, abraded, and covered with gangrenous spots. According to Orfila, corrosive sublimate, on being mixed with albumen, gluten, milk, animal broth, or bile, forms a precipitate, which consists of oxymuriate of mercury and animal matter. He accordingly recommends these substances, particularly the white of eggs, as the most effectual remedies we have, in cases of poisoning from corrosive sublimate. The vegetable gluten of wheat flour is said to be equally efficacious with the white of eggs. The flour is said to be administered in substance mixed with water.

Corrosive sublimate, by cautious management, is a very valuable remedy in a variety of diseases. It is particularly applicable, however, in the secondary symptoms of syphilis, in which it is extolled above all the other mercurial preparations, by some physicians, whilst others condemn it as ineffectual and injurious in its ultimate consequences. Boerhaave, Van Swieten, De Haen, Pringle, Rocher, and others, speak greatly in favor of the powers of this remedy in syphilis. Van Swieten directs it to be given dissolved in proof spirits in the proportion of one grain of the sublimate to two ounces of French brandy. Of this from one to two tablespoonfuls is to be given twice a day.

"Among the principal advantages," says Dr. Francis, "which the corrosive sublimate possesses over every other preparation of mercury are, that, judiciously administered, it is particularly mild and safe in its operation, will admit of a more extensive use in all the various forms of lues venerea, and subject the patient to fewer inconveniences; that it readily enters into the general circulation, becomes miscible with the several fluids of the body, the soonest arrests the progress of the complaint, and eliminates the morbid matter through those emunctories best calculated for that purpose; that it supersedes the necessity of salivation, by its action on all the secretions, and by promoting especially the cuticular discharges, and the evacuations from the kidneys; that it is the only preparation to be depended on in those peculiar habits of body so susceptible to become salivated by every other form of mercury now in use; that, in its ultimate effects upon the constitution, it is attended with comparatively no injury. These facts are indeed truly important, and many of them are granted by those who altogether reject the use of this preparation."*

Dr. Locher, of the Vienna Hospital, on the recommendation of

* Observations on Mercury, by Dr. Francis, in the 4th vol. of the Medical and Philosophical Register.

Van Swieten, employed this remedy very extensively in syphilitic affections, and we are told that from the year 1754 to 1762, he cured not less than four thousand eight hundred and eighty persons with it without producing salivation; and that "no persons died, or experienced the least painful and dangerous symptoms, in consequence of this remedy." "That the corrosive sublimate," says Dr. Francis, "of all mercurial preparations, soonest affects the system and arrests the action of the venereal virus, is a truth grounded upon the concurring experience of the most distinguished practitioners."

"It is but proper to state, that the preparation of mercury now recommended, has been employed for the last twenty years in the private practice of Dr. Hosack, and during his attendance at the New York State Prison, New York Hospital, and the Almshouse of this city, as physician of those institutions. It has invariably been found to be the remedy best calculated for the removal of lues venerea both in its primary and secondary stages; and not a single case is recollected in which the cure has not been permanent. Those injurious effects upon the stomach and bowels, which are so much apprehended, were avoided by a cautious employment of the medicine, and by a due consideration of the peculiarities in the constitution and state of the patient. From this form of mercury, salivation scarcely ever was induced, and while under its influence, the employment of the decoct. guaiac. et sarsaparil. was found to be an excellent auxiliary in recent cases; and in the secondary stage of the disease, where the patient had been neglected, or where improprieties in the cure had been committed, it was almost indispensable."* It must be confessed, however, that much respectable testimony is opposed to the employment of corrosive sublimate in venereal affections. Mr. Pearson particularly speaks unfavorably of its powers. "The result of my observations," says he, "is, that simple mercury, calomel, or calcined mercury, are preparations more to be confided in for the cure of primary symptoms than corrosive sublimate. The latter will often check the progress of secondary symptoms, very conveniently, and I think it is peculiarly efficacious in relieving venereal pains, in healing ulcers of the throat, and in promoting the desquamation of eruption. Yet, even in these cases it never confers permanent benefit, as new symptoms will appear during the use of it: and on many occasions, it will fail of affording the least advantage to the patient from first to last."†

My own experience with this remedy, though not very exten-

* Vide an Inaugural Dissertation on Mercury, embracing its Medical History, Curative Action and Abuse in certain Diseases, New York, 1811.

† On Various Articles of the Materia Medica in Lues Venerea.

sive, is entirely in favor of its powers in lues venerea. I have, for twelve years past, been in the habit of employing the preparation almost exclusively in every stage of syphilis, and I have never known any ill consequences to follow, which could be fairly ascribed to its influence. In ulcers of the nose and gums, caries of the bones, exostoses, nodes, and cutaneous eruptions from a syphilitic taint, corrosive sublimate, with opium or cicuta, is a remedy of unquestionable efficacy; and my own practice furnishes me with instances that yielded to this remedy after the milder mercurial preparations had been long, though ineffectually employed.

Corrosive sublimate is said to be less useful in this disease, when it is principally seated in the lymphatic and glandular systems.* It is also less applicable in cases connected with much muscular debility and scirrhosities, than some of the milder preparations of this metal. I have hardly ever given it in any other way than in union with the extract of cicuta. This combination has appeared to me to be particularly useful in the secondary stage of syphilis occurring in persons of a strumous habit; and it is also much less apt to produce disagreeable effects on the stomach and bowels, than when administered by itself. In employing this remedy, however, it ought to be continued for some time after the symptoms of the disease have disappeared. This, indeed, should always be done whatever be the preparation of mercury employed; but I am inclined to think, that this precaution is more especially to be attended to in the use of the corrosive sublimate.

Mr. Burckhardt considers corrosive sublimate as almost a specific against the swellings which occur about the joints of rheumatic persons.†

Corrosive sublimate has been recommended as an useful escharotic application to venereal and cancerous ulcerations. Justamond says that a powder composed of equal portions of sublimate and arsenic, is an exceedingly active escharotic, producing less pain than either of these articles by themselves. It is, however, beyond a doubt, that the corrosive sublimate produces much more pain when applied as an escharotic, than many other articles we possess; nor does it appear that its usefulness in this respect is such as to compensate for the superior pain it creates. Dissolved in lime-water, however, (constituting the aqua phagedenica,) in the proportion of two grains of sublimate to one ounce of the lime-water, it forms a lotion much recommended in ill-conditioned ulcers of every kind. A weaker solution of this kind,

* Burdach.

† De usu hydrargyri muriatici corrosivi in tumore pro arthritico habitu. 1808.

consisting of from two to three grains of the former to eight ounces of the latter, forms one of the most useful injections for gleet, leucorrhœa, and gonorrhœa after the inflammation has been reduced. This injection is particularly recommended by Mr. Carmichael. The aqua phagedenica is also the most efficacious application we have for the cure of that vesicular inflammation produced by the poisonous vine, (rhus radican.)*

In the treatment of cutaneous affections, corrosive sublimate is by many regarded as the most efficacious of all the mercurial preparations, whether applied externally, or used internally. Hegewisch, a German writer of note, observes, that a solution of corrosive sublimate is the best remedy we possess in the prurigo podicis; and Willan, Bateman and others confirm this statement. In erysipelas, this solution is also a most excellent remedy. Applied to the inflamed parts, it often arrests the disease in a speedy manner, as I have myself witnessed in several instances. This practice, so far as I can learn, originated with Dr. Schott, of this city, and is, I am well convinced, entitled to much attention.

The dose of this article is from one-eighth to one-fourth of a grain, repeated twice or thrice daily. It is always best to begin with the smallest dose, and gradually to increase it to as much as can be borne by the patient without feeling any particular uneasiness in the stomach and bowels. It may also be very conveniently given in solution in ether or proof spirits. The former of these solutions is particularly recommended by Hufeland. He directs it to be made by dissolving one grain of the sublimate in a drachm of sulphuric ether, the dose of which is ten drops in a cup or lukewarm milk three or four times a day.

The incompatible substances are: the carbonates of the fixed alkalies, which precipitate it of a yellow color; ammonia, which forms with it a white triple compound; tartarized antimony, nitrate of silver, acetate of lead, sulphur, sulphuret of potass, and soaps, all of which decompose it; iron, lead, copper, bismuth, and zinc, in their metallic state, precipitate it, forming an amalgam on the metal employed. The infusions of chamomile, horseradish root, colomba root, catechu, cinchona, rhubarb, senna, simaruba oak bark, and almond emulsion, precipitate it.†

HYDRARGYRI CHLORIDUM MITE.—HYDRARGYRI SUBMURIAS.—CALOMEL.

According to the chlorine doctrine, calomel consists of one proportional of chlorine with one proportional of quicksilver, forming,

* Dr. Barton. † Paris's Pharmacologia.

therefore, a chlorite of mercury.* The name which is given to it in the British and American Pharmacopœias, though sanctioned by general custom, is considered by chemists as very objectionable. For, "if we regard it as a compound of muriatic acid and oxyd of mercury, it is not a submuriate, but as much a muriate as the corrosive sublimate; the only difference depending upon the degree of oxidizement of the mercury, which is at a minimum in calomel, and a maximum in sublimate."

Calomel, as it is found in the shops, consists of an ivory-white, inodorous, and insipid powder, almost entirely insoluble in water, requiring, according to Rouelle, four hundred and fifty-two parts of boiling water to dissolve one part of the calomel.

Whether we consider calomel as a sialagogue, an alterant, or a purgative, it is undoubtedly the most important of the mercurial preparations. Being very mild and safe in its operation, and admitting, from its various powers, an exceedingly extensive application as a remedy, it is more generally employed in practice than, perhaps, all the other preparations of this metal put together.

Calomel is particularly useful in all diseases in which we wish to produce a general mercurial impression, and at the same time correct the action of the biliary organs, and evacuate irritating and noxious matter from the intestinal canal. Hence, in febrile diseases, and more especially in those of a bilious character, this preparation is almost exclusively employed where mercury is thought necessary; and even where its general influence is not wanted, its mildness and efficacy as a purgative render it one of our most valuable remedies in diseases of this kind. It is particularly useful in the diseases of children, on account of the ease with which it may be given to them, from its want of taste. When given in very minute doses, as from one-eighth to one-sixth of a grain, it allays irritability of the stomach and bowels, and restrains purging and vomiting; and hence, it is an excellent remedy in cholera and diarrhœa. I have already spoken of the anti-inflammatory powers of calomel and opium given according to the plan of Dr. Robert Hamilton; and I need only add, that the more I see of this practice the more do I become persuaded of its efficacy.

When mixed with lime-water, in the proportion of one drachm of calomel to eight ounces of lime-water, it forms the aqua mercurialis nigra. This is an excellent lotion for ill-conditioned primary and secondary venereal ulcers. It is particularly useful as a gargle in venereal ulcerations of the tonsils and palate.

* Calomel was formerly described under a variety of fanciful names; as draco mitigatus, aquila alba, aquila mitigata, manna metallorum, panchymagogum minerale, panchymagogus quercetanus, sublimatus, dulce, &c.

As an alterative it is given in the dose of from one-fourth to one grain; as a purgative, from five grains to one scruple. Calomel is decomposed by the alkalies, lime-water, soaps, sulphurets of potass and antimony, iron, lead and copper. These substances are, therefore, medicinally incompatible with it. "There is reason," says Dr. Paris, "for supposing that this preparation may undergo decomposition in transitu, and that therefore some substances may be chemically, and yet not medicinally incompatible with it."

It sometimes contains a small portion of corrosive sublimate, which renders its operation harsh, and even dangerous in delicate habits. The corrosive sublimate may be readily detected by boiling the calomel with a small quantity of muriate of ammonia. and adding carbonate of potass to the solution; if a precipitate take place, it is a proof of the presence of corrosive sublimate.

HYDRARGYRI NITRICO-OXYDUM.—RED PRECIPITATE.

This preparation consists of small bright red scales, of an acrid and corrosive taste. It is not a nitrate, as some will have it, but a subnitrate of mercury. It is insoluble in water; but in nitric acid it dissolves, with the evolution of heat, but without effervescence. This preparation is sometimes adulterated with red lead; "and this may be detected by digesting it in acetic acid, and adding sulphuret of ammonia, which will produce a dark-colored precipitate."*

Red precipitate is now but seldom employed as an internal remedy. The preparations already mentioned are both milder and more efficacious, where a general mercurial impression is necessary. Some late German writers, however, have spoken favorably of its internal use in old and obstinate venereal ulcers, rheumatisms, enlargement of the bones, and herpetic eruptions. It is particularly recommended in cases of this kind by Berg, Horn, and Hufeland.† Berg gave it in the dose of one-eighth of a grain with fifteen grains of sulphuretted antimony, and gradually increased it up to a grain.‡

As an escharotic it will be particularly mentioned in another place. It may not be improper, however, to say something in this

* Paris's Pharmacologia.

† Hufeland on the Internal Use of Red Precipitate in Obstinate Venereal Affections and other Diseases. Journal der Practischen Heilkunde, B. xxvii. st. 4, No. 5.

‡ J. F. Berg de Hydrargyri Oxydati Rubri usu interno. Francof. 1808. Vide Burdach, Mat. Med., vol. ii. p. 330.

place concerning its external employment in the form of an ointment—the unguentum hydrargyri rubrum. This ointment is much employed as a stimulating application to indolent and fungous ulcers; and is particularly useful in glandular or scrofulous ulcerations.

Externally applied, it is of considerable efficacy in herpetic and scrofulous eruptions. It must, however, be cautiously applied, and not upon too large a surface at once, since it has been known, in common with many other external applications, to produce dangerous effects, by suddenly repelling the eruption for which it was employed This ointment is also an exceedingly good remedy in chronic psorophthalmia, especially if the ulceration of the Meibomian glands is of a scrofulous nature. For this purpose it is advantageously united with opium or camphor. In opacity of cornea, Morenheim and Murdina recommend this ointment as very useful. Falk extols its powers in hemorrhoidal tumors, of which he says, it speedily lessens the pain and swelling, and gradually removes them altogether.* Ackerman recommends a salve made of ℈i red precipitate, gr. vi camphor, and ʒii of fresh unsalted butter, as an excellent application in chronic and obstinate ophthalmia.

HYDRARGYRUM AMMONIATUM.—HYDRARGYRUM PRÆCIPITATUM ALBUM.—WHITE PRECIPITATE.

This preparation consists of a fine snow-white powder, possessing neither odor nor taste. It is composed of eighty-one parts of mercury, sixteen of muriatic acid, and three of ammonia; and is soluble neither in water nor alcohol. It may be readily distinguished from calomel by its not turning back, like this latter preparation, on being triturated with lime-water. Boerhaave was much in the habit of employing this preparation internally, and he recommends it particularly as being very efficacious, and as seldom, if ever, exciting copious salivation. At present, however, its internal employment is entirely neglected, and it is now only used as an external application in cutaneous affections, &c. It is one of our most efficacious remedies for the itch; it is said to be particularly useful, and almost indispensable, in that variety of itch which is attended with large and thick scabs, scattered over the surface of the body. The unguentum Werlhoffi, which has been much extolled in cutaneous eruptions, consists of white precipitate and carbonate of potass, made into an ointment.

* Burdach.

HYDRARGYRUM SULPHURETUM RUBRUM.—CINNABAR.

CINNABAR is a red substance, of a crystaline appearance, possessing neither smell nor taste. It is insoluble in water, alcohol and acids; the alkalies decompose it when melted with it. "It is composed of two atoms of sulphur, and one of quicksilver, and is therefore a bi-sulphuret of mercury. It is sometimes mixed with red lead, which may be detected by digesting it in acetic acid, and by adding sulphuret of ammonia, which will produce a black precipitate."* If dragon's blood is mixed with it, it will impart a red color to alcohol.

Taken internally, cinnabar has but very little action on the system. Cartheuser says, it often passes off by the bowels, without producing any general impression on the animal economy. Lewis, however, states that he saw an instance of profuse and unexpected salivation excited by this preparation. At present it is altogether neglected as an internal remedy, being employed exclusively for the purpose of mercurial fumigations. Abernethy mentions its use in this way very favorably, and alleges that the system may be brought under the mercurial influence, by fumigations with this article, when the usual preparations of mercury are entirely inefficient. Mr. Pearson, however, whose opportunities of observation on this subject have been very extensive, does not speak very favorably of cinnabar as a remedy in lues venerea. He at least does not think it sufficient to eradicate the disease, without the concomitant employment of other mercurial remedies, although he admits that it may be resorted to with much advantage in cases of venereal sores in the mouth, fauces, nose, or on other parts of the body.

The fumigation is made, by throwing ʒss of the cinnabar on red-hot iron, and in holding the fumes, or letting them pass upon the affected parts as they rise. When inhaled, these fumes generally very soon excite copious salivation.

HYDRARGYRI SULPHURETUM NIGRUM.—ÆTHIOPS MINERAL.

THIS preparation is in the form of a black powder, without any particular taste or odor. It consists of one proportional of sulphur, and one proportional of quicksilver, being, therefore, a *sulphuret of mercury;* on being heated it becomes a bi-sulphuret. In a solution of pure potash, it is entirely dissolved, from which it may be again precipitated unchanged by adding any of the

* Paris's Pharmacologia.

mineral acids.* In water, alcohol, and the acids it is wholly insoluble.

The æthiops mineral is supposed by some to have a more powerful influence on the vessels of the cuticular surface than any of the other preparations of mercury. Others, on the contrary, deny it any superiority in this respect, and some even regard it as comparatively an inert remedy. Its remedial application appears now to be almost entirely confined to the treatment of cutaneous affections. Dr. G. Armstrong recommends it particularly in scabby eruptions of venereal origin. It has also been recommended in chronic rheumatism and glandular swellings. It does not, however, appear to be worthy of much attention; and it is now, indeed, but very seldom prescribed in any disease.†

* Paris's Pharmacologia.

† The *turpeth mineral* has already been noticed under the head of Mercurial Emetics, to which the reader is referred for all that is worthy of attention concerning its remedial powers.

CHAPTER XVIII.

G. MEDICINES THAT ACT UPON THE RESPIRATORY ORGANS.

I. *Medicines calculated to increase the Mucous Secretion in the Bronchia, and to promote its discharge.*

EXPECTORANTS.

These are medicines which promote the bronchial secretions, and facilitate their disharge by expectoration. In order to understand the modus operandi of these remedies, it is necessary to consider the particular conditions of the pulmonary organs, upon which difficulty or deficiency of expectoration may depend. In many instances, it appears to depend directly on an inflammatory state of the mucous membrane of the bronchial tubes, as is the case in catarrhal and pneumonic affections. Whatever, therefore, is calculated to lessen the inflamed condition of the bronchial lining, gives rise to a more abundant secretion of the mucus, and consequently to a more copious expectoration. Hence we find that such remedies as determine to the surface, are always the most useful expectorants in acute cases; and hence, too, a blister to the breast frequently brings on free expectoration under such circumstances. When, on the contrary, the inflammation has been subdued by depletion, the secretion of bronchial mucus is often so great that the debilitated powers of the system are inadequate to throw it off. In instances of this kind, we may bring on a free discharge from the lungs by such articles as excite the vital energies. Again, suppressed expectoration may arise from a torpid or spasmodic condition of the bronchial glands, as would appear to be the case in spasmodic asthma. Here expectoration is promoted by the stimulating antispasmodics, and by some of the balsamics, which, possessing a peculiar tendency to pass off by the mucous tissues, after having been absorbed into the circulation, are thereby brought to act directly upon the secretory vessels of the bronchia, and to excite them into action. When there

is a fixed source of irritation seated in the lungs, as, for instance, tubercles, the cough is very frequent, and the mucus being therefore discharged almost as soon as it is secreted, sufficient time is not allowed for its accumulation, and a consequent appearance of deficient expectoration exists. In cases of this kind, we derive most advantage from remedies that allay irritation, as opium, prussic acid, &c. By these means the cough is rendered less frequent, and time being thereby given for the accumulation of the mucous secretion in the lungs, a more abundant expectoration ensues on the recurrence of the cough. It frequently happens also, that an irritation in the fauces and glottis keeps up, by continuous sympathy, almost constant coughing. When this is the case the cough is most readily allayed by such articles as are of a mild mucilaginous nature, which, being swallowed, soothe the irritation of the fauces, and consequently that of the pulmonary system. But even where the irritation which keeps up a cough is primarily and exclusively seated in the mucous membrane of the bronchial tubes, demulcents probably do good by their soothing impressions upon the fauces alone. For, if an irritation in the fauces can be propagated to the lungs, and produce cough, a fact which is unquestionable, there is every reason to believe that an opposite impression may be likewise conveyed from the former part to the latter, and thus counteract, in a degree, the irritation in this part, and thereby relieve cough. There is still another mode, and to which I have already alluded, in which medicines may produce expectorant effects. It is a fact fully established by observation and experiment, that certain substances, when received into the system, have specific tendencies to act upon certain organs or structures. Thus cantharides affect the neck of the bladder, mercury the salivary glands, ergot the gravid uterus, &c. It is therefore not improbable, that some remedies may have a specific tendency to act upon the pulmonary system when received into the stomach; and this opinion would appear to be demonstrated by the fact, that several of our expectorants are known to be absorbed, and to be again eliminated by the pulmonary emunctories. Thus assafetida, whether injected into the abdomen of animals, or thrown into the stomach or rectum, is very soon discovered by its peculiar odor in the mucous surfaces, and especially in the mucous membrane lining the bronchiæ. So also onions, when taken into the stomach, impart an exceedingly strong and offensive odor to the breath.

From all this it is evident, that in prescribing expectorants, attention should be paid to the particular character of the symptoms which render them necessary; for a remedy that may be advantageous in this respect, in one case, may be useless, or even pernicious in another, requiring a medicine of this kind. Thus,

when cough and deficiency of expectoration arise from an acute inflammation of a bronchial lining, stimulating expectorants must be avoided. Where, however, these symptoms depend on a debilitated and spastic condition of the lungs, the stimulating articles of this class are those from which the greatest advantage is to be gained. Of the various diseases in which expectorants may be usefully employed, nothing need be said in this place, as these will necessarily come under notice when treating of the particular articles of this class.

RADIX POLYGALÆ SENEGÆ.

The diuretic and emmenagogue virtues of this article have already been noticed; and to complete its medical history, it only remains to speak of its virtues as an expectorant. In this respect it is entitled to very great attention, being undoubtedly one of the most active and useful articles of this class. Possessing, however, very considerable stimulant along with its other properties, it cannot be used with safety in cases attended with high inflammatory excitement. In the latter stages of pneumonia, after the general as well as local inflammatory action has been moderated by depletory measures, there sometimes remains a troublesome cough, attended with imperfect expectoration, which is in general greatly relieved by the use of a decoction of this root. It also acts very beneficially in cough excited by an irritation in the fauces and larynx from cold, and which is usually attended with hoarseness. In no disease, however, has this article been more extravagantly praised as an expectorant, than in cynanche trachealis. Dr. Archer, who first noticed its virtues in this disease, represents its powers as often adequate, without the aid of any other means, to remove this alarming malady. Although very seldom sufficient, by itself, to the performance of a cure in this disease, it is unquestionably a very useful remedy in its management. As an emetic, it has been used in the beginning of the disease, and there can be no doubt of its often manifesting very beneficial effects, when employed with this intention. Its stimulating properties, however, render it objectionable in the early stages of the complaint; and it is besides not equal to the tartar emetic in this respect, which is at once prompt, relaxing, and antiphlogistic in its effects. If, after the inflammatory symptoms have been reduced, a dry and hoarse cough, with oppressed respiration, remains, we possess no remedy equal in efficacy to the polygala. To children from two to six years of age, we may give one or two teaspoonfuls of a decoction made by boiling half an ounce of the root in a pint of water down to three gills, with

an equal quantity of honey, every one or two hours, until vomiting comes on. It is also an exceedingly good remedy in the hoarseness which is apt to affect children on taking cold, and which, if neglected, sometimes terminates in croup.

SCILLA MARITIMA.

The squill is very frequently prescribed as an expectorant, and may be considered as one of the most valuable articles of this class of remedies. In the pectoral affections of children, the oxymel of squill is a very convenient and useful remedy. Possessing emetic along with its expectorant properties, it is peculiarly serviceable when given to the extent of producing vomiting in very young subjects affected with cough, and attended with an accumulation of viscid mucus in the bronchia; in hooping-cough, also, it frequently affords much relief. Being, however, considerably stimulant in its operation, it can only be employed with propriety in cases unattended with inflammation and fever. In conjunction with the camphorated tincture of opium, it forms an excellent medicine in slight catarrhal affections. From its active diuretic properties, in connection with its virtues as an expectorant, it is particularly adapted to the treatment of hydrothorax. It may be given either in substance, or in the form of the vinegar or oxymel of squills. The dose of the powder is from one to four grains; that of the vinegar and oxymel from one to two teaspoonfuls. The following are excellent expectorant formulæ.*

ALLIUM SATIVUM.

The peculiar odor and acrimony of garlic are extracted by infusion in water; but by boiling they are almost entirely dissipated. In point of medicinal properties it bears considerable analogy to the squill; being, however, inferior to it in its powers. As an expectorant it has been frequently prescribed in catarrhal complaints, and it would appear to be more especially indicated from its diuretic virtues in such cases as are attended with a hydropic state of the system. Being, however, much more unpleasant, and less active than many other articles of this class, especially the squill, it is at present but seldom employed as an

* ℞.—G. ammoniac. ʒss; scillæ pulv. gr. x; syrup. tolutan. q. s. Ft. massa in pil. gr. v; dividenda. Take two every morning and evening.

℞.—Oxymel scillæ ʒiss; misturæ ammoniac. ʒiii; tinct. opii camph. ʒi. —M. Dose, a dessertspoonful morning and evening.

internal remedy in regular practice. It is usually given in the form of a syrup, or oxymel, which is made by infusing the root in vinegar, and afterwards adding honey to it until it acquires the consistence of a syrup.

The onion also is employed, particularly in domestic practice, as an expectorant; and its effects in this way are very useful.

ARUM TRIPHYLLUM.—INDIAN TURNIP.

This plant is found both in North and South America. The root, which is the part employed for medicinal purposes, is bulbous, fleshy, giving off a circle of numerous radicles from its upper part. The lower part of the bulb is covered with a blackish, loose, and wrinkled skin. When fresh it is exceedingly acrid, producing very violent smarting pain when taken into the mouth, which leaves a soreness for many hours on the tongue. Applied to the skin, however, it very seldom produces any rubefacient effects whatever. "The acrid property which resides in this and other species of arum," says Dr. Bigelow, "appears to depend upon a distinct vegetable principle, at present but little understood. It is extremely volatile, and disappears almost entirely by heat, drying, or simple exposure to the air." This principle appears to possess "no affinity for water, alcohol, or oil, being volatile; and, in a state of gas, inflammable."*

The dried root possesses but very little acrimony. It is, however, not destitute of active properties even in this state, and may be very usefully employed in pectoral affections, as well as in various other complaints connected with a cold and cachectic habit of body. It is by no means incapable, as is stated by some writers, of affecting the general circulation. Of the contrary of this I have more than once had satisfactory evidence. In the chronic asthmatic affections of old people, it is a remedy of very considerable value. I have also seen it do good in chronic catarrhs, and in phthisis pulmonalis. In these complaints it is, indeed, one of the most common remedies in domestic practice. It has also been prescribed with advantage in rheumatism, and in aphthous sore-throat. In this latter affection, Dr. Thacher says, it is a remedy of approved efficacy. It has been recommended in the form of an ointment made of the fresh root, in tinea capitis, and tetter. Dr. Burson states that the berry of the arum is more retentive of its peculiar acrimony than any other part of the plant. The arum root is usually directed to be given in the form of a decoction in milk; but Dr. Bigelow observes, that it imparts none

* Bigelow's American Medical Botany, vol. i. p. 56.

of its acrimony to milk on boiling. The best mode of administering it would appear to be in the form of an emulsion with gum Arabic and sugar. It may be given in doses of from twelve to sixty grains two or three times a day. Besides the articles already mentioned, there are a great many others from the vegetable kingdom, that possess expectorant properties; of which the following are the principal: Inula helenium, iris florentina, tussilago petasites, pulmonaria officinalis, borago officinalis, hedera terrestris.

G. AMMONIACUM.

This article has already been noticed under the head of antispasmodics. As an expectorant, its powers are very considerable. In the latter stages of pneumonia, after the fever and inflammation have been moderated, and in chronic catarrhal affections, attended with accumulations of mucus in the lungs, ammoniac, in union with muriate of ammonia, oxymel of squills, antimonials, laudanum, or nitric acid, &c., will in general afford much benefit. It may also be employed with peculiar advantage in chronic complaints connected with inordinate mucous secretions in the bronchiæ, and more especially, when those affections are attended with a cold and sluggish condition of the general system. It is also very useful in humoral asthma; and in the catarrhal affections of old people, a combination of gum ammoniac and squill forms one of our most valuable expectorants. It is particularly serviceable in those cases where the expectoration is deficient from a want of power to throw up this viscid bronchial mucus, and where the skin is cold, and the pulse weak and sluggish. In its general operation it is considerably stimulant. It is therefore inadmissible in cases attended with active inflammation or high arterial excitement. In chronic cough, accompanied with a torpor of the alimentary canal, I have known large doses of this medicine taken in the form of pills to afford much relief. For the doses and modes of prescribing ammoniac, the reader is referred to the account of this article under the head of antispasmodics. The following are excellent expectorant formulæ, into which this substance enters as a principal part.*

* ℞.—acidi nitric. ʒii; aq. fontanæ ℥viii. Misce et tere ammon. ʒii. Donec solutio fit, et emulsio evadit. Dosis coch. unum. mediocri ex liquore aliquo demulcenti.

℞.—Misturæ ammoniæ ℥i; syrupi tolut. ℥ss; cinnam. ℥iss; tinct. opii camph. ℥ss.—M. Fiat mistura. Dose, a tablespoonful three or four times a day.

ASSAFETIDA.

Besides its antispasmodic properties, assafetida possesses also very useful expectorant powers. Employed in the form of an emulsion, its effects are often highly beneficial in coughs, connected with a weak and cold habit of body, and particularly in pertussis, provided no inflammatory symptoms be present. In chronic cough attended with oppressed respiration and a copious secretion of bronchial mucus, assafetida generally affords considerable relief. Its stimulating quality renders it improper in cases connected with fever or inflammation. It may be administered according to the formula given below.*

CAMPHORA.

Although camphor has not generally been mentioned as an expectorant, it is nevertheless well entitled to notice in this place. In protracted catarrhal affections, unaccompanied by fever, it may be advantageously exhibited in union with squills, assafetida, opium, &c. It is said to be especially useful in cases of cough connected with a rheumatic habit, or depending on repelled cutaneous diseases, when given in combination with sulphur and antimony. Combined with the vinegar of squill, it forms a valuable expectorant in humoral asthma. The following is an excellent formula for exhibiting it as an expectorant.† The tinctura opii camphorata, is also a very useful medicine in this respect.

CARBONAS POTASSÆ ET SODÆ.

The carbonates of potass and soda have been long known to produce excellent effects in certain pulmonary affections attended with cough and accumulations of viscid mucus in the bronchia. According to Mascagni, it is very efficacious, when given in large doses, in pneumonia accompanied with an oppressive collection

The following is particularly recommended by Stoll.

℞.—G. Ammon., vitello ovi soluti, āā ʒii; aq. pulegii ℥vi; syrup. hysopi ℥i.—Misce, et exhibe cochleatim, alterius horis.

* ℞.—Assafetid. ϑii. Solve in aquæ menthæ ℥iii; acet. scillæ ʒii; syrup. tolut. ℥i.—M. Dose, a tablespoonful every third or fourth hour.

† ℞.—Pulv. camph. ϑiss; pulv. g. Arab. ʒiss; pulv. sacch. alb. ʒi. Tere simul cum aquæ puræ ℥vii; vin. antim. ʒiss; oxy. scillæ ℥iss.—M. Dose, a tablespoonful three or four times a day.

of slime on the lungs. It is also very highly spoken of by Dr. Pearson, as a remedy in hooping-cough, a disease in which it has very deservedly become a popular medicine. I have frequently prescribed it with much advantage in this affection, and never have known it to give rise to any unpleasant symptoms. The following is the formula recommended by Dr. Pearson.* In catarrhal affections, attended with irritation of the general system, I have repeatedly used the following expectorant mixture with decided benefit.†

BALSAMUM TOLUTANUM.

This substance is obtained from the toluifera balsamum, a native tree of South America, by making incisions through its bark, from which it exudes in considerable abundance during the hot season. It is a thick tenacious substance, becoming hard by age, and of a yellowish-brown color. It has a warm and sweetish taste, and possesses a fragrant odor, very similar to that of lemons. It contains a volatile oil, benzoic acid, and resin. Alcohol dissolves it readily. "When dissolved in the smallest quantity of a solution of potass, its odor is changed into one that resembles clove pink."

The balsam of tolu possesses no inconsiderable expectorant properties, and may be employed with benefit in chronic catarrhal affections, and especially in coughs connected with general debility and a cold phlegmatic habit of body. It is usually given in union with other articles of this class. The following formulæ, into which it enters, are excellent expectorant preparations.‡

BALSAMUM PERUVIANUM.

This balsamic substance is obtained from the myroxylum peruiferum, a native forest tree of South America. It is a viscid

* ℞.—Carbon. sod. gr. iii; vin ipecac. gtt. v; tinct. theb. gtt. i; aq. font. ʒi. This is a dose for a child a year old, which may be repeated every three or four hours.

† ℞.—Potassæ carb. gr. x; tinct. opii gtt. xx; vin. antim. gtt. xv; syrup. symp. ʒii; aq. fontanæ ℥i.—M. To be taken on going to bed.

‡ ℞.—Cetacei ʒii; vitel. ovi. q. s. ad solut. et adde aq. fontanæ ʒvi; syrup. tolutan. ℥iss; tinct. opii camph. ℥ss.—M. Dose, a tablespoonful every four hours.

℞.—Mistura ammoniæ ℥iv; syrup. tolut. ℥i; aq. pulegii ℥iii; tinct. opii gtt. l.—M. Take a tablespoonful three or four times a day.

liquid, of a dark brown color. It has an agreeable, aromatic and penetrating odor. Its taste, which is at first rather mild, soon becomes very acrid, somewhat bitter, and hot. It contains an essential oil, a peculiar resin, and benzoic acid. It is perfectly soluble in pure alcohol; sulphuric ether dissolves nearly the whole of it, but boiling water takes up only a part of the benzoic acid. This article was formerly much employed as a remedy in chronic pulmonary affections. By the authority of Dr. Fothergill, however, this balsam, in common with the other articles of this kind, was, until lately, almost entirely rejected as a remedy in pectoral diseases. The chief objection that has been urged against the employment of the balsams in affections of this kind is, their stimulating character; a quality which they undoubtedly possess in a very considerable degree; and which certainly also renders them inadmissible in all cases attended with acute inflammatory symptoms. There are, however, instances of pulmonary disease, which simulate genuine phthisis, being attended with purulent expectoration, cough, emaciation, with slight hectic fever, &c., and which depend on a chronic inflammation of the mucous membrane of the bronchia, in which the balsamic remedies often display the most salutary operation. In the chronic catarrhal affections of old people, and in asthma attended with a cold and torpid state of the system, the balsam Peru has been employed with excellent effect. It has also been praised as a remedy in gonorrhœa, and in various other diseases connected with a leucophlegmatic habit of body. Dr. Kollock, of Savannah, states that he has seen several cases of tetanus from wounds cured, as he believes, by the external and internal use of this balsam. The influence of this medicine, he says, "has, in several instances, almost immediately controlled the spasms, and of itself restored the patient when rapidly sinking under the very liberal use of opium, bark and wine. Two drachms in twelve or twenty-four hours is the largest quantity I have ever found it necessary to give."*

The balsam Peru is given in doses of from twenty to thirty drops, upon a bit of sugar, two or three times a day. It is also given in the form of tincture, from forty to sixty drops.

INHALATIONS.

The inhalation of aëriform fluids may be employed to great advantage in the treatment of pulmonic affections. In this way

* Thacher's Dispensatory.

we are enabled to make direct impressions on the respiratory organs, a circumstance which experience has shown to be of much consequence in many of the diseases to which these organs are liable. For the sake of distinctness, I shall arrange what I have to say upon this subject under the four following heads. Aqueous vapors: ethereal vapors: fumes of burning substances: and gases.

Aqueous vapors.—In catarrhal affections, attended with painful and difficult expectoration, much benefit may generally be obtained from the inhalation of the steam of hot water, or of vinegar and water. This acts as an emollient and soothing application to the tender and inflamed vessels of the internal surface of the bronchial tubes. In pneumonia, also, after the violence of the arterial excitement has been reduced by depletory measures, the inhalation of steams of hot water, or decoctions of emollient herbs, will often contribute much to the support of an easy and regular expectoration. In no affections, however, are inhalations of this kind more decidedly beneficial than in the paroxysms of asthma. "To moderate the severity of the paroxysms in asthma," says Dr. Thomas, "we cannot employ a more powerful and efficacious means of relief than the inhalation of warm steam frequently from an inhaler, or the spout of a teapot. An infusion of chamomile flowers, with the addition of a little ether, may be used on the occasion." Inhalations of warm water and vinegar are also often very serviceable in cynanche tonsillaris, and trachealis.

Ethereal vapors.—The inhalation of ethereal vapors is a remedy of very considerable value in certain affections of the respiratory organs. In dyspnœa, depending on a spasmodic condition of the pulmonary system, I have frequently derived very great benefit from the inhalation of the vapors of sulphuric ether. Dr. Pearson, who speaks very highly of the employment of the sulphuric ether in this way, affirms that its efficacy is considerably enhanced by dissolving in it some of the extract of cicuta. Mr. Alibert states, on the authority of an author whose name he does not mention, that the inhalation of sulphuric ether was found quite useful in a case of catarrhal phthisis, complicated with hysteria. The effects which arise from the inhalation of the vapors of this ether from a bladder are exceedingly remarkable, and resemble entirely those which are known to proceed from the inhalation of the nitrous oxide gas. The sensations experienced during the temporary madness it produces, are said to be indescribably pleasant; but the shock given to the brain by the experiment is violent, and has been known to bring on convulsions, and other alarming symptoms.

Quite recently, Dr. Bodtcher, of Copenhagen, has published

some observations on the efficacy of the vapors of camphor in complaints affecting the cavities of the nose, the throat, and the chest. He states, that in the worst cases of stoppage of the nose from cold, a piece of camphor need only be kept for a few minutes before it, to obtain great relief. In cynanche tonsillaris, camphor kept before the mouth or nose, is said frequently to produce much good. It has also been found very serviceable in spasmodic coughs, in croup, and in asthma.* I have never seen camphor employed in this way, and can say nothing concerning the value of this practice. Dr. Bodtcher, however, speaks with great confidence of its usefulness.

Fumes of burning substances.—The inhalation of the fumes of tar and of resin was very early considered beneficial in diseases of the lungs. The following observations of Pliny (Hist. Nat., lib. xxiii. cap. 6) have a reference to this subject, and are, I think, very interesting. "Silvas eas duntaxat quæ picis resinæque gratia raduntur, utilissimus esse phthiscis aut qui longa ægritudine non recolligent vires, satis constat; et illum cœli aera plus ita quam navigationum Ægyptiani proficere, plus quam lactes herbedos per montium æstiva potus." Dr. Mudge, of Plymouth, above thirty-five years ago, related a case of pulmonary consumption, attended with purulent expectoration, which was entirely cured by residence in the country, and the inhalation of the fumes of common resin twice a day. But the attention of the profession was more particularly directed to this practice, about six years ago, by a publication of Dr. Alexander Crichton, physician to the court of St. Petersburgh.† He gives an account of several consumptive patients, who were perfectly cured by the employment of the tar fumes. He states that the best mode of fumigation is to put the tar into an open vessel, over a lamp or hot iron, so as to produce a slow volatilization, until the air of the chamber is well impregnated. In this atmosphere the patient may remain from one to two hours together, two or three times a day. He observes, also, that when the cough and hectic have been considerably subdued, the fumigation should not be persisted in, as it is apt to produce a troublesome dry cough, "and prevents the enjoyment of what is then fit for the patient—common air."

In the treatment of hooping-cough, the inhalation of tar fumes is often highly beneficial. Mr. Wansbrough, of Fulham, in England, has related some very remarkable instances of the efficacy of this remedy, in this as well as in several other diseases, attended with difficulty of respiration. An infant three months

* Hufeland's Journal for June, 1822.

† An Account of some Experiments made with the Vapor of Boiling Tar n the Cure of Pulmonary Consumption. Edinburgh, 1817.

old, from an accidental exposure to cold, became affected with catarrh, and difficulty of breathing, attended with evident accumulation of mucus in the bronchial cells, which the child was not able to expectorate. The symptoms increased rapidly; leeches, emetics and expectorants were unavailingly used, and death appeared to be inevitable. In this situation he had recourse to *tar vapor*. "I applied it at a distance," he says, "whilst the child lay in its mother's arms, breathing quick and short, with frequent interruption, from what appeared to be accumulation in the bronchiæ. The little creature seemed revived the instant she inhaled the vapor, and made an effort to cough." The fumes were brought nearer to her nostrils, which soon occasioned cough and vomiting. The patient was greatly benefited by this, and by repeating the fumigation twice a day for about a week, she was perfectly restored. In two cases of hooping-cough, that had been mismanaged during the early periods of the disease, and in which the expectoration had assumed a purulent appearance, I have derived decided benefit from tar fumigations. This remedy has also been found very useful in asthmatic affections. In acute inflammatory affections of the lungs, however, it cannot be employed without doing mischief. "It appears," says Mr. Wansbrough, "in cases where the lungs are under the influence of an inflammatory diathesis, the exhibition of the tar fumes is improper; but in chronic pulmonary affections, and also subsequent to the existence of increased arterial action, I have no doubt of the superior efficacy of this remedy." Mr. Wansbrough employed the vapor of the Barbadoes tar. The inhalation of the tar fumes appears to be particularly beneficial in chronic bronchitis; or in that form of pulmonary consumption which depends on a chronic inflammation of the mucous membrane of the bronchiæ.

The inhalation of nitrous vapors has also been employed with much advantage, in certain affections of the respiratory organs. It is stated to be particularly efficacious in hooping-cough. Several cases of this disease are related by Mr. Patterson, in which these fumigations produced the happiest effects.* Dr. John Thomas, of this city, has also related an instance of the excellent effects of this remedy in the present disease.† The most convenient mode of applying nitrous vapors is, to put an ounce of sulphuric acid into a teacup placed in a sand-bath, and to add to the acid, from time to time, small portions of the nitrate of potash.

The practice of smoking the roots of stramonium in asthma,

* The Effects of Nitrous Vapor in preventing and destroying Contagion, by James Carmichael Smith, M. D., p. 117.

† American Medical Recorder, vol. v. p. 660.

and other pulmonary affections, does not appear to be entitled to much attention. I have prescribed it in several instances, but never with the slightest advantage. I have nevertheless seen some asthmatic persons who assured me that they generally derive benefit from it.

Gases.—Soon after the discovery of oxygen gas, many physicians directed their attention to its employment in the treatment of diseases, and the reports which were at first published of its effects were highly promising. A more enlarged experience, however, has not confirmed the expectations which were once entertained of its powers, and it is now as much too little attended to as it was formerly too highly extolled. The respiration of this gas was at first prescribed by Fourcroy in pulmonary consumption, and although its immediate effects appeared to be salutary, it was soon found to be one of the most certain means of hastening the progress of this disease to a fatal termination. Beddoes, believing that phthisis is essentially connected with a superabundant absorption of oxygen in the lungs, conceived the idea of placing consumptive patients in an atmosphere containing a smaller proportion of oxygen than the common air; or causing them to respire occasionally, from a proper apparatus, air with a reduced portion of this gas. Hence he recommends consumptive patients to live in low and miasmatic districts, to sleep in cowstables, or in other places containing a deteriorated atmosphere. Experience, however, did not realize the hopes which were entertained of this practice, although there are not wanting some well authenticated examples of its having procured advantage. Little as is to be expected from the respiration of oxygen, in phthisis pulmonalis, it is nevertheless a remedy of considerable value in a variety of other affections. In asthma it has been frequently employed with unequivocal benefit. Beddoes speaks with great confidence of the usefulness of oxygen gas in this disease. He affirms that as soon as it is respired, the laborious breathing ceases; the livid color of the countenance disappears, and respiration goes on freely and regularly. Dr. Thornton speaks highly of this practice. The respiration of atmospheric air, containing an augmented portion of oxygen, has also been found very beneficial in chronic cough depending on atony of the pulmonary organs. Various other gases have been employed in medicine, particularly hydrogen and nitrogen. Those who wish to be particularly informed relative to the employment of pneumatic remedies, may consult the works of Beddoes and Thornton on this subject.

CHAPTER XIX.

H. MEDICINES WHOSE ACTION IS PURELY TOPICAL.

DEMULCENTS.

Demulcents are medicines calculated to obviate or lessen the effects of irritating matters, and that "not by correcting or changing their acrimony, but by involving it in a mild and viscid matter, which prevents it from acting upon the sensible parts of our bodies, or by covering the surface exposed to their action."

The mode in which this class of substances proves remedial, is, therefore, very simple, being nothing more than an interposition of a bland fluid between the irritating matter, and the parts exposed to their influence. As inflammation frequently exists in parts from which it is impossible to exclude substances of an irritating nature, and to which we may nevertheless make direct applications, it is a matter of very great consequence to be able to apply such substances as afford some protection to the sensible and inflamed parts. Thus in inflammation of the bowels, we derive advantage from mild mucilaginous drinks, by protecting the bowels from their irritating contents; so also in ophthalmia much relief is obtained by a few drops of mucilage, as, for instance, that of the pith of sassafras dropped into the eye, by which the inflamed conjunctiva is less irritated by the tears and atmospheric air.

It is not so easy to perceive, however, in what way demulcent remedies prove beneficial in parts to which they must reach through the medium of the circulation, as, for instance, in the diseases of the urinary passages. It is probable, as has been supposed, that they prove beneficial in the disorders of these parts, only by the large quantity of water which is usually taken with them, and by which the urine is rendered less irritating.

GLYCYRRHIZA GLABRA.

The liquorice is a perennial plant, indigenous to the south of Europe, and naturalized in the United States. The root, which

is the only part used in medicine, has a peculiar sweet and mucilaginous taste. It contains, according to the analysis of M. Robiquet, some amylaceous fecula, a peculiar saccharine matter (glycion) different from common sugar in not being fermentable, a new crystaline substance, possessing the appearance, but not the chemical character of a salt, and a resinous oil.* The acetate of lead, muriate of tin, and nitrate of mercury, form a copious and more or less light brown precipitate, with the concentrated aqueous infusion of this root.† Its saccharine matter, but none of its other principles, is extracted by alcohol. Water is its proper menstruum. By successive infusions it yields different extracts. That which is obtained by the first is yellowish, and of an agreeable sweetish taste; that obtained by infusing it a second time, is darker and less agreeable; the matter extracted by a subsequent infusion has scarcely any sweetness; but on the contrary, is bitterish and acrid.‡ When employed in decoction, it should therefore be boiled but a very short time; otherwise it will acquire a bitterish and unpleasant taste. The root yields a very large portion of a black extract, which is moulded into round pieces, well known by the familiar name of liquorice stick.

The liquorice root is seldom employed by itself, being commonly prescribed in combination with other substances, either to correct their taste, or to improve their expectorant properties. As an expectorant demulcent, it is, indeed, a very excellent remedy. Being mild and unirritating in its effects, it may be employed in the acute as well as in the chronic forms of catarrhal affections. The extract dissolved, and taken either by itself or in conjunction with other expectorants, is very frequently used in disorders of this kind. The following are expectorant formulæ.§

ULMUS FULVA.—SLIPPERY ELM.

THERE are four species of ulmus indigenous to the United States. The present species seldom rises above thirty feet in height, with a slender trunk dividing into numerous branches, and invested with a rough, light-colored bark. The leaves are oval-oblong, with a very long point, pubescent on both sides,

* Alibert, Elémen. de Thérap.

† Pfaff's Materia Med., B. i. s. 193. ‡ Ibid.

§ ℞.—Extract. glycyrrh. ʒii; aq. font. ferv. ℥iii.—M. ft. solut. deinde adde vin. antim. ʒii; tinct. thebaic. gtt. xl.—M. Dose, a tablespoonful every two or three hours.

R.—Extract. glycyrrh. ʒii; solve in aq. fœniculi ℥iii; aq. ammoniæ ʒi; aq. fontanæ ℥v.—M. Dose, a tablespoonful three times a day.

serrated on their edges, and unequal at the base; the buds are tomentose, with a thick tawny wool; the flowers sessile; succeeded by membranous seed-vessels of a compressed and oval shape, containing one oval seed.

The inner bark of this species of elm contains a very large portion of mucilage, which is readily extracted by infusion or gentle decoction. In the treatment of catarrhal affections, in pneumonia, and in consumption, the infusion of this bark may be very usefully employed. It is also an excellent demulcent in affections of the urinary passages, and particularly in some of the diseases of the alimentary canal. In dysentery, its beneficial effects have been abundantly testified. I have very frequently used it in this disease, from the very commencement through its whole course, in conjunction with other remedies; and so well satisfied am I of its utility, that I seldom now prescribe in the complaint without ordering copious draughts of this excellent demulcent. Dr. Maxwell Sharp, of Tennessee, relates two cases of this disease in children, attended with excruciating tormina in the umbilical region. A great variety of remedial means had been used without advantage, and the two little patients appeared to be sinking fast. He was finally induced to try the elm bark decoction, on the authority of Dr. Mease, whose paper he had read in Dr. Coxe's Medical Museum; and "the effect," he says "was so immediate that it appeared to act like a charm on the disease."* Dr. Mease has informed me that the infusion of this bark is a common drink among women, when near their confinement, from a prejudice in favor of its powers to procure easy labors. This supposed virtue, he thinks, is probably derived from the aborigines of our country, among whom it is known that this drink is constantly taken upon similar occasions. It does not seem probable to me, that its efficacy in dysentery depends entirely upon its demulcent quality; for other vegetable demulcents, such as flaxseed tea, solution of gum Arabic, &c., are not equal to it in this respect. It certainly possesses some active properties, as its beneficial effects in certain diseases evince, and which cannot be ascribed to its demulcent powers. Thus the internal use of the decoction of this bark has been found very efficacious in lepra vulgaris, and in other varieties of cutaneous diseases.† It is seldom found to show its good effects in these complaints, before its use has been continued for several months. The more diuresis it produces, the more certain is its beneficial operation. It is said frequently, at

* Coxe's Medical Museum, vol. ii. p. 123.

† Lettsom, Med. Memoirs of the Gen. Dispensary, sect. iii. p. 152. Lyoans, in the Medical Transactions, vol. ii. Banau, in Abh. für Pract. Aerzte, B. ix. p. 195. Richter, Specielle Therapie, B. vi. p. 95.

first, to increase the eruption, and this is considered an evidence of its ultimate good effects. For this purpose, two ounces of the bark are to be boiled in three pints of water down to one pint, and this is to be drunk in the course of a day. Quite recently the elm bark has been recommended by Mr. Henry Jeffreys, as a valuable substitute for sarsaparilla.* He employed it with decided advantage, in those cases for which sarsaparilla is usually prescribed. He used it according to the following formula.† The elm bark may also be used with very good effects, as an external application, in ulcers, cutaneous eruptions, gun-shot wounds, chilblains, &c. For this purpose the bark must be bruised and boiled in water, and applied in the shape of a poultice. The mucilage which this bark contains, affords very considerable nutriment. Dr. Strong states that a soldier, who lost his way, supported himself for ten days on this mucilage and sassafras.

ACACIÆ GUMMI.—GUM ARABIC.

The greater part of pure gum Arabic is furnished by the *acacia vera* of Willdenow, a tree which grows in the sandy deserts of Arabia Petræa, Africa, and Egypt. It is obtained by exudation from incisions made into its bark. There are, however, a number of other trees from which a gum, similar to that furnished by the acacia vera, is obtained, and which is commonly mixed and sold with a genuine acaciæ gummi.‡ Dr. Duncan observes that "it is remarkable that the barks of all the trees which furnish this bland mucilaginous substance, are highly astringent; that of the mimosa nilotica (acacia vera) itself is used in India for tanning; and in our own country the cherry and plum-trees, which sometimes yield a little gum, have very astringent barks.

Two kinds of gum are met with in the shops, which are usually sold indiscriminately under the name of gum Arabic. The genuine gum Arabic consists of small irregular and roundish pieces, colorless, or of a very pale yellow color, breaking with a shining conchoidal fracture, without smell, and a faintly sweet and mucilaginous taste. The other variety, which is brought from Senegal, consists of much larger globular masses, of a yellowish brown, or dark brown color, having a rough or wrinkled

* Cases of Surgery, by Henry Jeffreys, 8vo. p. 237.

† ℞.—Decoct. ulmi. (Ph. L.) Oc. viii; sassafras rad. concisæ. Guaiaci ligni rasi sing. ℥i; mezer. rad. corticis ʒiii; glycyrrhizæ rad. contusæ ℥i; decoque per horam et cola. The dose is from half a pint to one pint a day.

‡ All the species of mimosa, the swietenia febrifuga, melia azadirachta, and the various species of the genus terminalia.

surface. Gum Arabic is soluble in every proportion in water. It is also dissolved by the pure alkalies, lime-water, the vegetable acids, but not by alcohol, ether and oils. The nitrate of mercury converts the solution of gum Arabic into a beautiful peach-blossom color, a circumstance which may be considered characteristic of this gum. The gum Senegal assumes a more bright red, and becomes slightly turbid on standing some time.* Chlorine, passed through a solution of gum Arabic, converts it into citric acid.† A very diluted solution of the nitrate of iron converts its solution into a yellowish color, becoming slightly turbid, and depositing a white sediment which is insoluble in nitric acid. "Neither the strong acids nor alcohol, when considerably diluted, occasion any disturbance in it; but sulphuric ether, and its compound spirit, the tincture of muriated iron, and subacetate of lead, produce very dense precipitates; the acetate of lead only occasions decomposition when an alkaline salt is present in the formula: the volatile alkali curdles the mucilage, and hard calcareous waters render the mixture difficult and often impracticable."‡ When dissolved in water in the proportion of one part of the gum to six parts of the water, it forms a mucilage about the consistence of a syrup; with two parts of water it forms a very thick mucilage.

Gum Arabic is one of our most useful and pleasant demulcent remedies, and is much employed in affections of the lungs, bowels, and urinary passages. In the treatment of dysentery, the free use of this mucilage is often productive of very salutary consequences. In the chronic bowel-complaints of children, it is peculiarly beneficial; I have prescribed it with complete success in such cases, after a variety of other remedies had been tried ineffectually. As it is highly nutritious, children laboring under such affections may take it freely as a nourishment; indeed, I have sometimes confined them almost exclusively to it for several weeks, and in one instance, I have seen a little patient restored to health by this treatment alone, after the case appeared to be hopeless. In catarrhal complaints, and particularly in coughs depending on irritation in the fauces or glottis, considerable relief may sometimes be obtained by allowing the gum to dissolve slowly in the mouth. Its solution is also much used as a demulcent drink in strangury, ardor urinæ, and gonorrhœa. In pharmacy the mucilage of this gum is much employed in forming emulsions with oils, resins, balsams, &c., and to suspend heavy and insoluble substances in water.

* Pfaff's System der Materia Medica, B. i. p. 111.

† Annales de Chimie, vi. p. 178.

‡ Paris's Pharmacologia.

GUMMI TRAGACANTHA.

This gum is obtained by exudation from the astragalus creticus, a thorny shrub growing on the island of Candia, and other parts in the Levant. It comes to us in the form of long, crooked, and somewhat flattened pieces, and occasionally also in irregular lumps. The color of the best sort is whiter: that which is of inferior quality is generally of a pale red or yellowish brown. It is translucent, and has no lustre. When put into water, it swells up very much, but does not dissolve so as to form an entirely transparent solution. The acids, particularly concentrated nitric acid, and the caustic alkalies, render the aqueous solution of this gum more transparent.

The solution of gum tragacanth exceeds that of all other substances in viscidity. Eighty grains of the gum form a mucilage with thirty-two ounces of water of the consistence of a syrup. It is used, like gum Arabic, as a demulcent in catarrhal affections, &c., and for pharmaceutic purposes. It is not, however, equal to gum Arabic for making emulsions with oily or resinous substances; nor should it be employed for making pills, unless they are to be taken soon after being made; as it becomes exceedingly hard and difficult of solution on becoming dry.

SEMEN LINI.

Flaxseed contains a very large portion of mucilage, which is readily extracted by infusion. The mucilage resides chiefly in the cuticle of the seed. Their parenchymatous substance contains, besides a mucilage, a large portion of a bland oil; some albumen, and a very small quantity of saccharine matter.* An ounce of the unbruised seeds, infused in a pint of boiling water, forms a moderately thick, ropy, colorless mucilage, possessing no odor, and a sweetish mucilaginous taste. Cold water does not extract any mucilage from the unbruised seeds.

The infusion of flaxseed is frequently prescribed as a demulcent in diseases of the lungs, bowels, and urinary organs. The bruised seeds are much employed in conjunction with other substances, for emollient cataplasms.

* Pfaff's Materia Medica, B. i. s. 123.

MUCILAGO SEMINUM CYDONIORUM.

The seeds of the quince afford a very large quantity of a fine, colorless mucilage, which, as in the flaxseed, resides principally in their external or cortical portion.

It is readily extracted from the unbruised seeds even by cold water. One part of quince seeds, with three parts of cold water, will form a mucilage as thick as that which is formed by equal parts of gum Arabic and water. This mucilage forms a copious flocculent precipitate, of a clear white color, with the acetate of lead, and the chlorite of tin. The mucilage obtained from the bruised seeds, is not pure; it is mixed with a portion of albumen, which is very abundant in the kernel of the seed, and also with a quantity of farina. In boiling water, they give out an exceedingly large quantity of mucilage, one part of the seeds being sufficient to impart to forty-eight parts of water, the consistence and appearance of the albumen of an egg.*

This mucilage is almost exclusively used as an external remedy. In acute ophthalmia, it is a very excellent application. It is sometimes employed in cases of this kind, in union with sugar of lead; but such a combination does not appear to be a proper one, as it forms a pretty copious precipitate with this salt.

Besides the substances already mentioned under this head, there are a variety of other articles which are employed for their demulcent properties. Amongst these the following are the principal: Radix althea, semen psyllii, herba et flores malvæ, malvæ rotundifolia, a plant exceedingly common in the United States, and medulla sassafras. This latter, the pith of the young branches of the sassafras, forms a beautiful, colorless, and pure mucilage by decoction, which has been much recommended as an application to the eye in acute ophthalmia.

OLEUM OLIVÆ.—OLIVE OIL.

Olive oil is of a pale yellowish color, without odor, and of a pleasant bland taste. When perfectly pure it congeals at a temperature of 38° of Fahrenheit. With the exception of the oil of almonds, it is the lightest of the fat oils, having a specific gravity of no more than 0.915. It is composed of forty-nine parts of carbon, thirty of oxygen, and twenty-one of hydrogen. It possesses less activity as a laxative than the oleum ricini; it is,

* Pfaff's Mat. Med., B. i. s. 122.

nevertheless, in many cases, a very useful aperient, and is much employed for this and other purposes in medicine.

This oil was very extensively used by the Roman physicians as an external application in the cure of diseases. Celsus, Galen and Aetius were much in the habit of employing oily frictions; and have left us some excellent observations in relation to the cases in which they are applicable.

A good deal has been said of the utility of frictions with this oil in dropsy. Cases of ascites are said to have been cured by such frictions assiduously applied to the abdomen.* Dr. Donald Monro informs us that although unsuccessful in his attempts to cure ascites in this way, he found it effectual in some cases of anasarca.†

It is probable, however, that very little, if anything, is to be ascribed to the oil in such cases. It is well known that frictions, whether with or without any intermediate substance, have a considerable tendency to excite the activity of the absorbents; and it is not unlikely that all the good that has ever been done in this disease by oily frictions might have been obtained by frictions with the dry and bare hand.

This oil has also been much recommended, both as an internal and an external remedy, against the effects of the bites of venomous snakes and insects.‡ It does not, however, appear to be entitled to any attention for its supposed remedial virtue in cases of this kind.

The external application of warm olive oil has been much employed as a remedy against the plague. Baldwin especially speaks in the highest terms of this practice. According to this writer the patient is to be briskly rubbed all over with the warm oil, which is to be repeated every day, and assisted by warm drinks, and the heat of a bed, until a copious perspiration is excited. This practice is only effectual when early employed.§

To blunt the activity of certain poisonous substances brought into the stomach, olive oil is of unquestionable utility. Its powers, in common with other oily or fat substances, to prevent the deleterious effects of lead upon the system, are well known to those who are much exposed to the influence of this poison, it being a common practice among such persons to fortify them-

* Ovier, Storck, Burdach, &c.

† Alibert. Nouveaux Elémens de Thérapeutique, vol. ii p. 252.

‡ Abr. Vater diss. de antidoto novo adversus viperarum morsum præstantissimo. Viteb. 1763. Ejusdem. Progr. pro olei olivarum efficaciam et virtutem adversus morsum animalium venenatorum confirmat. 1751.

§ Osservazioni circa un nuovo specifica, contra la peste, ritrovato e fatto sperimentare, da 9. Baldwin, 1800.

selves against its effects, by the daily use of olive oil, or some other fat or oily substance.

Burdach says* that it should never be given where narcotic poisons have been swallowed, since, as he observes, it is not only useless, but absolutely injurious in cases of this kind.

Olive oil may be advantageously employed as an aperient in cases of habitual costiveness, and in colica pictonum. It operates, commonly, with considerable promptness and certainty, and may be conveniently exhibited with other articles of this class, as manna, the resin of jalap, &c.

In ileus it is said to be an exceedingly good remedy given either alone or in combination with opiates. Gallesky recommends it to be given in the dose of a tablespoonful every hour until the bowels are moved and the pains abate.

Malacarnet has published a memoir on the internal employment of olive oil in wandering arthritic pains. He gave from one to two pounds of this oil, having previously added a portion of culinary salt to it, in the course of two or three days. He speaks very favorably of this practice.

This oil has also been recommended as a vermifuge; its powers in this way are, however, of no consequence.

Olive oil is often adulterated by the oil of poppy seeds. This fraud may be readily detected "by exposing the oil to a freezing temperature, when the olive oil will congeal, while that of the poppies will remain fluid: and since those oils which freeze with most difficulty are most susceptible of rancidity, the admixture of poppy oil must be regarded as injurious; it also deserves notice, that the peculiar habitudes of *oil of olives* with *per-nitrate of mercury*, offer a distinguishing character, by which the adulteration of the oil may be satisfactorily detected; for if the *per-nitrate* (made by dissolving six parts of the metal in 7.5 of nitric acid of sp. grav. 1.36, at a common temperature), be mixed with olive oil, the mixture, if kept cold, will, in the course of a few hours, become solid, whereas if it has any admixture of the oil of grains, it will not undergo such a change. The contamination derived from lead, which is frequently immersed in the oil for the purpose of removing its rancidity, may be detected by shaking one part of the suspected sample with three parts of water, impregnated with sulphuretted hydrogen, in a stopped vial."‡

* Arzneimittellehre, B. ii. s. 118.

† Samlung Auserlessener Abhandl., Bd. xii. St. iv. s. 579.

‡ Paris's Pharmacologia.

CHAPTER XX.

ESCHAROTICS.

These are substances capable of destroying the texture of animal matter. They are employed to remove excrescences; to open abscesses; to form artificial ulcers; and to change the condition of ulcerated surfaces. They are usually divided into *eroding escharotics*, and *caustic escharotics*. But the only foundation for this division appears to be the difference in the degree of their activity.

POTASSA FUSA.—COMMON CAUSTIC.

This is the most powerful escharotic with which we are acquainted. As it is usually met with in the shops, it consists of small cylindrical pieces, of a white color externally, and a pale purple color internally. It is deliquescent, and dissolves readily both in water and alcohol. It is a hydrated protoxide of potassium. This caustic is chiefly employed in forming issues, opening abscesses, and in destroying the callous edges of ulcers. Being rapid and powerful in its effects, and very deliquescent, considerable care is required in its application, lest it destroy the parts to a greater extent than is necessary or proper. The action of caustic potash may, however, be readily arrested by applying vinegar to the part upon which it is rubbed, and thus neutralizing and destroying its properties.

The formation of a superficial eschar by means of this caustic, is attended with particular advantage in several affections. In paronychia, before suppuration has taken place, it is an excellent application to put a stop to the further progress of the disease. For this purpose, the caustic is to be applied so as to form a thin eschar immediately over the spot where the pain is felt most severely. This practice originated with Dr. Perkin, of this city. A similar practice may also be used with much advantage in buboes of an indolent character. Of the use of caustic issues in diseases of the spine, phthisis, tetanus, &c., I have already spoken, when treating of issues and setons, in the chapter on Epispastics.

NITRAS ARGENTI.—LUNAR CAUSTIC.

This metallic preparation has already been described under the head of Tonics,* and it only remains in this place to notice more particularly its powers as an escharotic. The nitrate of silver is much less powerful as a caustic than the preceding article; but in the majority of cases where such applications are indicated, it is decidedly preferable to the potash, both on account of its greater mildness, and its being less apt, from the property it possesses of coagulating animal matter, to spread and form extensive eschars. Where the surface of an ulcer requires an application of this kind, the lunar caustic is by far the best, as it is more apt than any other articles of this class to give a disposition to the new granulations to heal. A weak solution of this substance forms an excellent lotion to excite the weak granulations of fungous ulcers; it may also be employed with much advantage as an injection in gonorrhœa; and in puriform discharges from the ear. In the latter of these affections, a solution of this substance injected into the ear, is said to be particularly useful; it was, I believe, first recommended by Mr. Saunders, and lately Mr. Curtis, surgeon-aurist to the Prince Regent, has published several cases in which it was successfully employed.† In one of the cases which he reports, he states, that "the patient began by using ten grains in four ounces of water, and I increased it to the extent of thirty-five grains, which completely healed the parts; and I had the further satisfaction, at the same time, to find her hearing restored. It may be necessary, perhaps, to mention, that it took nine months to complete a cure."

ARSENICI OXYDUM.

The white oxide of arsenic is a very powerful escharotic. Its employment in this respect has been chiefly confined to the treatment of cancers, and for which purpose it seems to be the best escharotic we possess. When applied to an ulcerated surface of this kind, it often destroys the diseased parts very deeply, and seldom extends its destructive effects to those which are healthy. Richter states, that he employed the arsenic as an escharotic in cancerous ulcerations of the face, with decided benefit. It is, however, much too powerful to be employed for purposes of this kind without being mixed with other articles of a mild cha-

* P. 244.

† London Medical and Phys. Journal for May, 1819.

racter. Various substances have been used for this purpose, such as sulphur,* hemlock, orobanche virginiana, sanguis draconis, &c. The *paste arsenicale* was formerly much employed by the French surgeons as an escharotic for cancer. This mixture consists of seventy parts of cinnabar, twenty-two of sanguis draconis, and eight of white oxide of arsenic, formed into a paste with saliva at the time it is applied. It has also been used in the form of solution, which is an excellent mode of applying it when we wish merely to destroy the surface of the ulcer. If it create very great pain, we need only wash the part with a solution of opium.

In phagedæna gangrænosa, which, according to the observations of Mr. Blackadder, "is always primarily a local disease, produced by a specific morbid poison, a solution of arsenic applied to the affected part has been found to produce the happiest effects."†

ALUMEN EXSICCATUM.

When alum is exposed to heat, it yields its water of crystalization, enters into a sort of fusion, and finally dries into a white spongy, and very light substance, which possesses considerable escharotic powers. When prepared for this purpose, the heat employed to fuse it must not be too intense or very long continued, lest the alum be deprived of too much of its acid, upon an excess of which its escharotic powers depend.‡ This substance may be used with very good effect in venereal chancres, as well as in other ulcers having weak and spongy granulations. It is very frequently employed to destroy fungous excrescences, &c.

HYDRARGYRI NITRICO-OXYDUM.

The subnitrate of mercury, or red precipitate, is much employed as an escharotic in weak and fungous ulcers. It is not very powerful in this way, and seldom occasions much pain on being applied to an ulcer. It is used either by itself, sprinkled on the surface of the sore, or in the form of an ointment, in which way it is an excellent stimulating application to weak and spongy granulations.

* See formula for Bernard's Mixture, 258.

† Observations on Phagedæna Gangrænosa, by Home Blackadder, Lond. 1818.

‡ Paris.

HYDRARGYRI OXYMURIAS.

The corrosive sublimate is powerfully escharotic, but as its action in this way is exceedingly painful, it is very seldom employed for this purpose. A solution of it in lime-water, the aqua phagedenica, already mentioned in a former part of this work, forms a very useful lotion in foul and indolent ulcers, venereal sores, cutaneous affections of a local character, &c. Justamond recommends a powder composed of equal portions of sublimate and arsenic as one of the best escharotic applications to venereal and cancerous ulcerations. When thus combined, he says, they produce less pain than either of these articles by themselves.

SULPHAS CUPRI.

The sulphate of copper possesses pretty active escharotic properties, and may be employed with very good effect in venereal chancres, as well as in other sores having weak and spongy granulations. It may be used either in substance or in solution. A crystal of it cut into a pointed shape and applied to a chancre for a few moments, will, in general, answer every purpose that can be expected from such applications. A weak solution, consisting of about three grains to an ounce, forms an excellent stimulating application to foul and languid ulcers.

MURIATIC ACID.

I do not know that this acid has ever been used as an escharotic. In indolent ulcers, however, it occasionally proves an excellent stimulant; and in the slow caries of some of the spongy bones it may be employed with great advantage. I owe this latter idea to my friend, Dr. M'Clellan, who has lately been induced, from speculative views, to prescribe the diluted muriatic acid in several cases of this kind, at the Philadelphia Almshouse and elsewhere. In one instance, he informs me, a very troublesome caries of the os calcis was speedily and effectually cured by the daily repetition of injections of the diluted muriatic acid; and in several other cases, important, though not equal, relief was obtained from the same remedy. Indeed, it will not prove difficult to conceive that this acid may be introduced into a fistulous ulcer, in so weak a state of dilution as not to injure the healthy surfaces, and yet prove sufficiently strong to dissolve the dead bony

spiculæ, and to excite the morbid parts to granulation and cicatrization.

NITRIC ACID.

This acid has frequently been employed by empirics for the destruction of tumors, and perhaps it may be considered as the most useful as well as the most powerful of all the escharotics, whenever an immediate destruction of diseased parts is required. By the sudden and powerful excitement which it creates, it produces the advantageous effect of subverting the morbid train of action in the surrounding vessels, more extensively and permanently than any other of this class of remedies. Mr. Welford, in the eleventh number of the Medico-Chirurgical Transactions, speaks very highly of it as an escharotic, in a species of sloughing ulcer which occurred among the prostitutes of London. Dr. M'Clellan, of this city, has also resorted to it, in consequence of Mr. Welford's representations, with the most decided advantage, in three different cases. In one of Dr. M'Clellan's patients, who came under my notice last summer, a very large sloughing ulcer of the penis, which had been making a rapid and destructive progress, was immediately arrested, and a speedy cicatrization effected, without the aid of any constitutional treatment. In the Philadelphia Almshouse a similar case, which alternately put on a phagedenic and sloughing appearance, and which had long resisted every other mode of treatment, was effectually subdued by the same remedy, under the care of Dr. M'Clellan. The method of using the nitric acid in such cases is, to smear all the sound parts in the immediate vicinity of the ulcer with basilicon ointment, and then to apply pledgets of lint, dipped in the strong acid, over the morbid surface. The acid should not be diluted. By pressing the lint firmly upon the ulcer a few seconds, the whole surface will be deadened, and a deep slough remain, underneath which healthy suppuration and granulations will ensue.

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